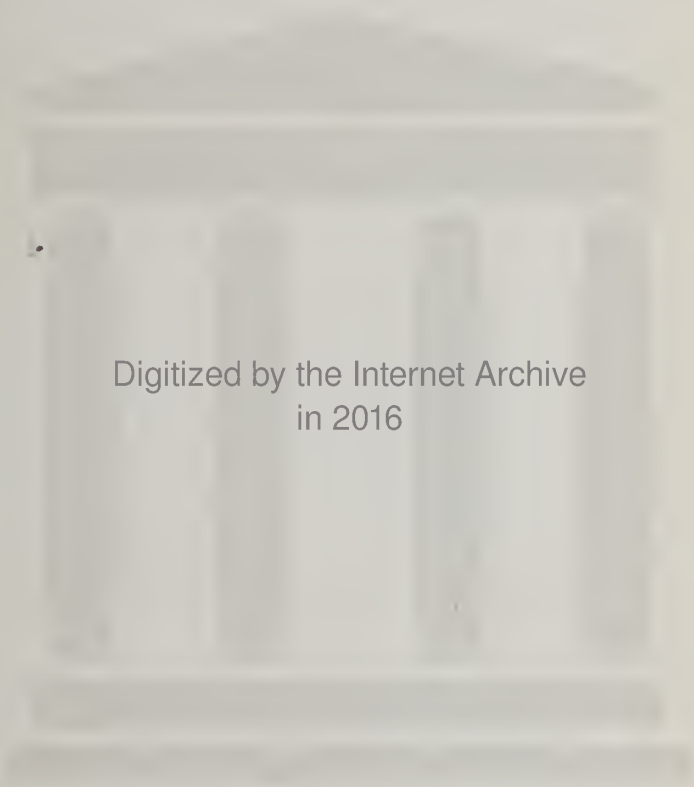
LIBRARY
OF THE
Theological Seminary.
PRINCETON, N. J.
PER AS 472 .A84 v.16:2
Journal of the Asiatic Society of Bengal



Digitized by the Internet Archive
in 2016

https://archive.org/details/journalofasiatic169asia

# JOURNAL

OF THE

# ASIATIC SOCIETY OF BENGAL,

EDITED BY

## THE SECRETARIES.

---

VOL. XVI.

PART II.—JULY TO DECEMBER, 1847.

"It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of Asia will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted, and it will die away if they shall entirely cease."—SIR WM. JONES.

CALCUTTA:

PRINTED BY J. THOMAS, BAPTIST MISSION PRESS.

1847.

JOURNAL

OF THE

# ASIATIC SOCIETY.

SEPTEMBER, 1847.

## *On the Charj, or Otis Bengalensis.* *By* B. H. Hodgson, *Esq.*

Family STRUTHIONIDÆ VEL OTIDÆ.
Sub-family Otinæ.
Genus Eupodotis.
Species bengalensis vel deliciosa vel himalayana.
Charj and Dábar of Hindusthan and Bengal.
Greater Florican of British Sportsmen.
Habitat. The Tarai.

Of all Indian game birds the most striking to the eye and the most grateful to the palate is the Charj or Dábar. Latham introduced it to the scientific world above half a century back; and yet so little had been added in the interim to his crude knowledge of its real character and habits that Mr. Vigors could recently suppose it an inhabitant, or at least visitant of the sub-Himálayas;* nor am I aware that any one has to this hour undertaken to give intelligible body and shape to the mere scientific shadow of a species delineated by Latham. As the Charj is found more abundantly in the Tarai than elsewhere, and as I happen to possess a tolerably accurate knowledge of its structure and habits, (the latter very difficultly procurable,) I purpose to present to the Society in the following paper the substance of my information respecting this most elegant and high-flavoured bird, which our own sportsmen with the gun, and native chiefs and Princes with the Baz,†

* Gould's Century, where is a very bad figure.

† Astur palumbarious fæm. Goshawk.—Male is Júrrá.

pursue with an energy proportionate to the value of a prize not to be exceeded for the table, especially in March, when it is in highest condition.

*Habitat and Range.*—The Charj appears to be confined to the Bengal Presidency, and to a part only of it, for I find no notice of this species in the Catalogues of Jerdon, of Sykes, or of Franklin, and in fact even in the Gangetic provinces the Charj is nearly limited to the left bank of the Ganges, and there to the districts adjacent to the sub-Himálayas, though I believe it is also found in the somewhat similar districts intervening between south Behar and Nagpúr and Midnapur. "Tarai" is an Indian term equivalent to Pays Bas, Landes, Marches, and Marshes, of European tongues; and *the* Tarai par excellénce is applied to a low lying, moist and rarely redeemed tract of level waste extending, outside the Saul forest, along the base of the sub-Himálayas from the debouche of the Ganges to the Brahmaputra. This tract, of great extent and peculiar features, is the favourite and almost exclusive habitat of the Charj, which avoids the mountains entirely, and almost, if not quite, as entirely, the arid and cultivated plains of the Doab, and of the provinces west of the Jumna, the latter of which are still less suited than the Doab to the Charj's habits, which prompt it to dwell upon plains indeed and exclusively, but never upon nude or cultivated plains. Shelter of nature's furnishing is indispensable to it, and it solely inhabits wide spreading plains sufficiently elevated to be free from inundation and sufficiently moist to yield a pretty copious crop of grasses, but grasses not so thick nor so high as to impede the movements or vision of a well-sized bird that is ever afoot and always sharply on the look out. Such extensive, well-clad, yet uncultivated plains are however to be found only on the left bank of the Ganges, and accordingly I believe that to that bank the Charj is nearly confined, and to the Tarai portion thereof.

*Manners.*—The Charj is neither polygamous nor monogamous, nor migratory nor solitary. These birds dwell permanently and always breed in the districts they frequent, and they dwell also socially, but with a rigorous separation of the sexes, such as I fancy no other species could furnish a parallel to. Four to eight are always found in the same vicinity though seldom very close together, and the males are invariably and entirely apart from the females, after they have grown up.

Even in the season of love the intercourse of the sexes among adults is quite transitory, and is conducted without any of that jealousy and pugnacity which so eminently distinguish most birds at that period. In the season of love the troops of males and females come into the same neighbourhood, but without mixing. A male that is amorously disposed steps forth and by a variety of very singular proceedings, quite analogous to human singing and dancing, he recommends himself to the neighbouring bevy of females. He rises perpendicularly in the air, humming in a deep peculiar tone, and flapping his wings. He lets himself sink after he has risen some 15 or 20 yards; and again he rises and again falls in the same manner, and with the same strange utterance, and thus perhaps 5 or 6 times, when one of the females steps forward, and with her he commences a courtship in the manner of a Turkey-cock, by trailing his wings and raising and spreading his tail, humming all the time as before. When thus, with what I must call song and dance, the rites of Hymen have been duly performed, the male retires to his company, and the female to her's; nor is there any appearance (I have, at some cost,* had the birds watched most closely) of further or more enduring intimacy between the sexes than that just recorded, nor any evidence that the male ever lends his aid to the female in the tasks of incubation and of rearing the young. The procreative instinct having been satisfied, the female retires into deep grass cover and there, at the root of a thick tuft of grass, with very little semblance of a nest, she deposits two eggs, never more nor less, unless the first be destroyed. If the eggs be handled in her absence, she is sure to discover it and to destroy them herself. The eggs are of the size and shape of an ordinary domestic fowl's, but one sensibly larger and more richly coloured than the other. This larger and more highly tinted egg is that of the male young, the smaller and less richly hued egg, that of the female progeny. The female sits on her eggs about a month, and the young can follow her very soon after they chip the egg. In a month they are able to fly; and they remain with the mother for nearly a year, or till the procreative impulse again is felt by her, when she drives off the long since fully grown young. Two females commonly breed near each other, whether for company or mutual aid and help; and thus the coveys, so to speak, though they are not literally

* Unhappily I lost a valuable man by malaria.

such, are usually found to consist of 4 to 6 birds. The Charj breeds but once a year in June, July. That is, the eggs are then laid, and the young hatched in July, August. The moults are two annually, one vernal from March till May, and the other autumnal, which is less complete and more speedily got over between August and October. The young males up to the beginning of March entirely resemble the females; but the moult then commencing gradually assimilates them to the adults, which never lose, as the lesser species or Likh* is alleged to do after the courting season, the striking black and white garb that in both species is proper to the male sex, and permanently so to the larger species from and after its 1st year of age. The young males of a year have the hackles and crest less developed than those graceful ornaments afterwards become, though otherwise after their moult there is little difference to be seen in them from the aspect of maturity. There is therefore properly speaking no nuptial dress in this species, though the hackles and crest in their most entire fulness of dimensions may be in part regarded as such. The Charj is a shy and wary bird, entirely avoiding fully peopled and fully cultivated districts, but not averse from the neighbourhood of a few scattered squatters whose patches of cultivation, particularly of the mustard plants (Rai, Tori, and Sarsún) are acceptable to the Charj as multiplying his chances of appropriate food. This exquisitely flavoured bird is a rather promiscuous feeder, small lizards, young snakes, insects of most sorts, but above all, locusts, and after them, grasshoppers and beetles, the sprouts and seeds and succulent runners of various grasses, berries, stony fruits, aromatic lactiferous leaves, and stems of various small plants, with mustard tops and other dainties, all contributing to its nourishment. The largest portion of its usual food is vegetals: but, when insects abound and especially locusts, they are almost exclusively eaten. Cerealia are eschewed: but plenty of hard seeded grasses and such like are taken, and a goodly portion of gravel to digest them. The Charj is seldom found in thick cover. When he is, he lies close, so that you may flush him at your foot; but in his ordinary haunts

* Otis Auritus: fæm. fulvus: long confounded with the Charj and cited erroneously by that name even by Mr. Jerdon. Not half the size of the Charj, common in the western, rare in the eastern, Tarai, and visits the valley of Nepal in May, June, when the moult is just on.

amid the scattered tufts of more open grassplats he can be neared with difficulty only, and No 5 and a good heavy gun are required to bring him down at 40 to 60 yards' distance. His flight is strong, with a frequent, rapid, even, motion of the wings, and, if he be at all alarmed, it is seldom suspended under 2 to 300 yards, whilst not unfrequently it is continued so as to carry the bird wholly out of sight and pursuit. When flying the neck is extended before the body and the legs tucked up under it, whereas the whole family of the Herons fly with neck retracted over the back, and legs stretched out behind; differences the rationale of which can as little be conjectured as the gyrations of the Dog ere he lays himself down to repose. The walk of the Charj, like that of the Heron, is firm and stately, easy and graceful: he can move a foot with much speed, and is habitually a great pedestrian, seldom using his powerful wings except to escape from danger, or to go to and from his feeding ground, at morn and eve, or to change it when he has exhausted a beat. This species is silent and tranquil, and seldom utters a sound, but if startled, its note is a shrill metallic clink, chik-chik, and the more ordinary note is the same but softer and somewhat plaintive. The amorous ditty of the male has already been mentioned. The female is silent on those occasions.

*Aspect, form, and size.*—The Charj or Dábar is a largish and very graceful bird, measuring 2 to 2¼ feet from tip of bill to tip of tail, and 3½ to 4 feet in expanse of wings, and weighing 3 to 4 lbs. Bill to gape 2¼ inch, to brow 1½. Wing 14 inches. Tail 7. Tarse 6 to 6½. Central toe and nail 2⅛. The bill is short and rasorial, or rather crane-like, (Anthopoides.) The eye, large and soft. The head depressed, and adorned, in the males, with a full pendant crest. The neck, long and thin, but in the males set off with a beautiful series of hackles or slender composed plumes depending from the whole front of the neck. The body is plump. The wings ample and firm. The tail, short, broad and rounded; and the legs, long and suited to much walking. I will now give some more minute details which the incurious can pass over.

Bill to gape, equal to head, considerably depressed towards the base, and at the base twice as broad as high. Maxilla more than half excided by a large membranous and plumed fosse in which the elliptic nares are situated. Towards the tip the maxilla is rounded, full and

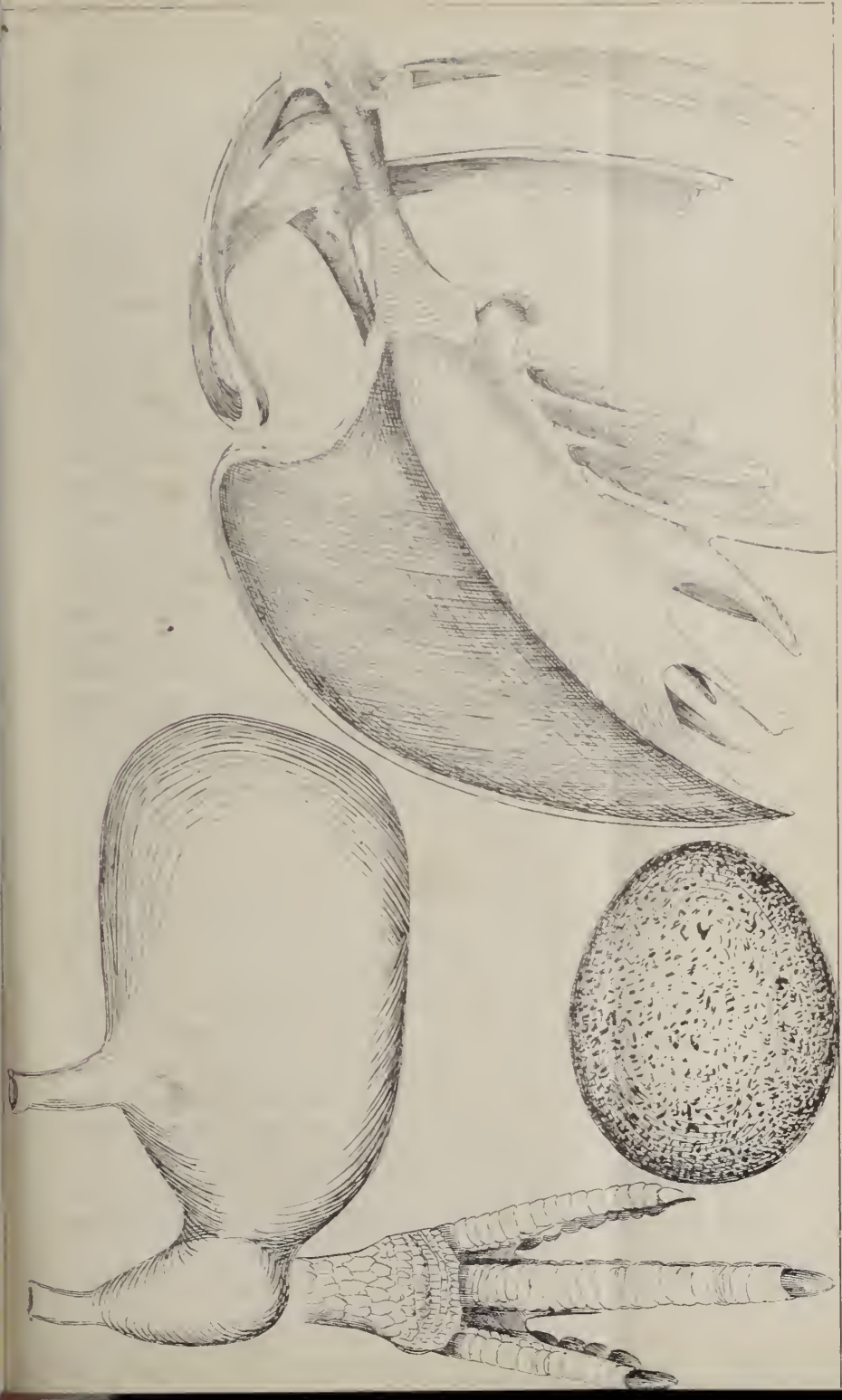
hard, with its tip inclined and notched. Mandibula straight and entire. Gape ample, soft, smooth. Frontal plumes produced far over the bill. Crest full, dishevelled, pendant, 4 inches long. Hackles narrow, composed, 3 inches long, extending from the gullet to the breast. Wings ample, nearly equal to the tail, about one inch less; its end, firm, not bowed, 3rd or 4th quill longest; 1st and 2nd but slightly gradated. Primes somewhat acuminated in the males, but less so than in the Likh, and emarginated sharply high up on both webs. Tertials broad, soft, not discomposed, but exceeding the primes in length. Tail 16 plumes, moderately and evenly rounded, with upper coverts nearly equalling the plumes. Legs elevate, strong, reticulate throughout. Tibia half nude and about equal to the tarse. Toes short, stout, scutellate, full soled, united by a small basal membrane. Central toe much the largest. Laterals slightly unequal. Nails obtuse, strong, solid, pent or convex above, flat below.

*Colours.*—Male. Head, neck, and body below, glossy black. Back, scapulars, tertials next them, and tail-coverts richly marbled, cuneated and zigzaged with jet black upon a rich buff ground. Alars white. Their tips, shafts and external margins (in 3 quills) black; caudals black with white tips and more or less of buff mottling. Legs sordid stramineous with a bluish tinge. Bill dusky plumbeous above. Blue grey below. Carneous towards the gape. Eye pale hazel.

*Female.* Of a rich buff or pale pure fulvous where the male is black. Her alars black, vermiculated more or less with buff. Her neck yet more minutely zigzaged crosswise with brown and her entire upper vest and tail, superbly cuneated, barred and zigzaged with a glorious game mixture of black and fulvous. On the cap the same hues, disposed lengthwise. Sexes of equal size.

*Eggs.*—The eggs, about the size of those of a bantam, two inches long by $1\frac{1}{2}$ broad, are of a sordid stramineous hue, very minutely dotted and more largely blotched and clouded with black, somewhat as in Lobivanellus goensis, or the Indian Lapwing.

*Osteology—Sternum.*—The entire form and substance of the breast bones indicate great powers of flight. The sternum is 4 inches long, $2\frac{1}{4}$ high and $1\frac{1}{2}$ wide. Culmenally it describes a high convex curve with the edge of its keel, which is itself (the keel) no less than $1\frac{1}{2}$ inch deep. Postcally the sternum terminates gradually and has its walls or



sides disappearing in rear with a slope exhibiting two rather deep notches on either side. The furcula is strong, moderately bowed outwards, but very round at its junction with the keel, and curved highly in the culmenal direction so as to fall in with the high convex sweep of the sternal keel. The furcula is not anchylosed with the head of the sternum as in the largest migratory Storks and Cranes. The clavicles are very strong and have very powerful and large crura. (See sketch).

*Soft anatomy.*—The intestinal canal is little more than one length of the bird from tip of bill to tip of tail; about 1½ of the skeleton; 28 to 30 inches in length, and of large diameter. Cœcum 7 to 8 inches long, dilating globosely towards the blind end, and situated 5 to 6 inches from anal extremity of intestines. Stomach 8½ inches by 2, along greater and lesser arches, a sub-gizzard. Outer coat of considerable, unequal thickness, but much below the true gizzard type in muscular mass, and the muscle pale and flaccid. Inner coat leathery and striated. Shape of stomach more or less ovoid; its upper orifice central; its lower, terminal. Towards the latter a curved constriction dividing a small glandulous, from the general triturant portion of the organ. No trace of gular sac. Tongue medial, simple; its tip subbifid.—This bird is congeneric with the Likh (Auritus) which Mr. Gray separates from Otis and places in Lesson's Genus Sypheotides, hodie Enpodotis. I had named the form, Oticulus.

---

*The Slaty blue Megaderme. Megaderma schistacea, N. S.—By* B. H. Hodgson, *Esq.*

VESPERTILIONIDÆ.

Rhinolophinæ.

(Phyllostominæ of Gray.)

Genus Megaderma?

Megaderma schistacea, mihi.

Habitat, Northern Bengal towards the Tarai.

It is very seldom that the observer of Nature has an opportunity at once and adequately to describe a species in its habits and mature form,

and when the opportunity occurs it should never be neglected, since a great deal of most unprofitable labour in the gradual rectification of those inadequate descriptions which are the inevitable consequence of the ordinarily limited means of observation, is thus prevented. Chance lately threw such an opportunity in my way in regard to a species of the Bat kind; and, though the 80 genera and innumerable species of the Vespertilionidæ, might well alarm an unprovided field Naturalist like myself, I trust I shall be able to see my way through a fitting description without the spectacles of Library and Museum.

Arriving recently at the staging Bungalow of Siligori, on the verge of the Sikim Tarai, I found that hospitium scarcely habitable owing to the stench of Bats, and was told that orders had already been issued for the ejection of these unwelcome tenants by the removal of the false roof, between which and the external pent roof the creatures had domiciled themselves, so securely and in such numbers that summary measures of ejectment had become indispensable. I waited to see and profit by these measures, and so soon as the false or flat canvas roof was partially removed, I beheld innumerable (2 to 300) Bats clinging in the usual inverted manner to the pent roof. Presently they were most of them on the wing. Many escaped by passing betwecu the wall and eves, their usual way of egress prior to this disturbance. And these fled, freely through the mid-day suu, to the proximate out houses. Many more were struck down by my people whilst attempting to pass out by the doors; and thus, in half an hour, I became possessed of some 50 to 60 specimens, when the slaughter was suspended by my orders: my specimens and observations then and for 10 previous days having left me nothing further to learn, and the wanton destruction of the poor creatures being shocking to me, how amusing soever to the group of natives, who moreover declared that the Superintendent had commanded the whole to be destroyed. My ample spoils were procured towards the close of February under the circumstances just stated, and the examination of them, coupled with the observations of the preceding ten days of my residence at the Bungalow, put me in possession of the following numerous and decisive particulars as to the habits of the animal, to wit, that this species of Megaderme is extremely gregarious, and dwells in the dark parts of houses and out-houses, not concealed in crannies or holes, but openly suspended from any convenient rest;

MEGADERMA *schistacea* (Hodgson)

PL XXXIX

T. Black, Asiatic Lith.c Press Cal

that the species does not hibernate (nor I fancy does any Indian Bat, even in the lofty and cold sub-Himalayas, under at least 5000 feet of elevation); that it is entirely nocturnal, though capable of a vigorous flight even at noon of a sunny day; that it is exclusively insectivorous, and has no such cannibal propensities as are stated to belong to one of its congeners, nor consequently are its haunts entirely avoided by the smaller species of true Bat (Vespertilio proper) though the numerousness of its own race leaves not much room for the intrusion of strangers; that the males and females dwell together promiscuously even when the females are gravid and nearly parturient, and therefore probably always; that the young are seemingly driven away so soon as they can shift for themselves, all those taken by me having been well grown; that the females bring forth in spring and perhaps also in autumn, the latter point resting on information, the former on the fact that all my females were, on the 26th February found variously, but far, advanced in their pregnancy; that the males are more numerous than the females in a high proportion, or from $\frac{1}{3}$ to $\frac{1}{2}$ more; that the females bring forth only a single young one at a time, not one instance of double gestation occurring among my numerous specimens; and, lastly, that no other species dwells mixedly with this Megaderme, though a species of true Bat of diminutive size was found tenanting the same house, and the two were observed to issue forth at night from their respective and distinct domiciles simultaneously, and so as constantly to cross each other in their flight, a flight sustained by both with equal power, yet without any aggression of the larger on the smaller kind.

Having said so much of the manners of our animal I proceed to its form and structure, merely premising that I think it is a true Megaderme, although its phalangial system is apparently irreconcileable with Cuvier's general or Geoffroy's particular definitions in that respect,* for it has two bony phalanges to the thumb, two also to the index, and three to each of the remaining fingers. In other respects it is a complete Megaderme and a striking examplar of a Genus of Bats, which, though diffused throughout the plains of India, is absolutely unknown in the mountains, at least on the sub-Himalayas. The Megadermes

* See Regne animal, Vol. II, pp. 7 and 10, Vol. V. p. 74, Nat. Libr. Vol. XII. I, p. 123, and Vol. VII. p. 74. So far as my observation of the Family of Bats goes the phalangial system of our specimen is unique, and, should it prove so, the type might be denominated Eucheira.

appear to be found all over the plains of India and its islands, extending thence to Africa; and wherever found they are as numerous in individuals as scant in species, only three distinct kinds being yet recorded, notwithstanding the immense geographic diffusion of the Genus. The subject of the present paper is however, I believe, a novelty, and to the careful description of it I now proceed.

The Slaty Megaderme of the Tarai is $3\frac{1}{2}$ inches long from snout to vent, the head, to the occiput, $1\frac{1}{4}$, the ear to the lobe, $1\frac{1}{2}$, the caudal membrane (for there is no tail) $1\frac{1}{2}$, the arm $1\frac{1}{2}$, the forearm $2\frac{1}{2}$, the longest finger 5, the thigh $1\frac{3}{8}$, the leg $1\frac{3}{8}$, the planta and nails, $\frac{3}{4}$, the expanse 18, and the weight 2 oz. Sex makes no difference in size or aspect, and immaturity, after the growth is well advanced, little or none. The colour of the fur is, for the most part, a clear deep slaty blue above and sordid buff below, of the membranes deep brown, and of the eye, very dark. Females resemble males. Juniors have the slaty hue less pure or smared with brown. The moderate-sized and depressed head ends bluffly to the front, where the simple and adpressed lips are covered with downy piles and short divergent hairs, except in front of the lower lip which is nude and faintly grooved. Two moderately large and roundish plates are laid flat on the nose, one above and the other below the ovoid nares, which lie hid completely between them. The upper plate becomes at the base of the bridge of the nose somewhat narrowed, and then is continued into an erect free process, more or less concave, and divided longitudinally by a central ridge; the shape of the process being elliptic. The eyes, which have a backward and laterally remote position, are small, but still larger considerably than in the Bats proper or in the Rhinolphes, though less so than in the Pteropines. The immense nude and rounded ears have their bases low down and forward, so as nearly to pass under the eye, where there is a vague antitragal development, and immediately above it, but quite distinct, rises the inner ear consisting of an acute spire, and a small rounded process, in line with it, which latter is sometimes notched on its round edge. The true ears are united over the forehead above half way to their tips and of course can therefore have very little mobility. Nor do the ears exhibit any of that exquisite sensibility for which the ears of the Rhinolphes are so remarkable. The body is muscular and strong with a large sternal keel or crest, and is covered abundantly with

silky hair of one kind that is laxly applied to the skin, and more or less wavy in some specimens, smooth in others. The flying apparatus, or alar and caudal membranes, are very ample, the latter being extended to the heel or tarse, and so as, when expanded, to run straight across from heel to heel. The alar membrane commences at the centre of the forearm's length, takes in the first joint of the thumb, makes a large angle so as to envelope the long mid-finger, and then passes pretty evenly to the heel. There is no trace of tail, nor any caudal vertebræ. The thumb has two equal bony joints, whereof the first is enveloped in membrane and the second free and nailed as usual. The index has one entire joint and a second rudimental, which however is half an inch long nearly, and all the other digits have three complete bony phalanges each. There are two pectoral and two enguinal teats, whereof the latter are the larger and bear more appearance of having been sucked. The penis is pendant: the tests internal: the womb simple; there is no frontal sinus: stomach purely membranous and globose, with proximate orifaces: intestines from 11 to 14 inches, of pretty equal calibre, and having a grain-like cœcum, $\frac{1}{8}$ inch long, at 1 to $1\frac{1}{2}$ inches from the anal end of the gut: great arch of stomach 3 to $3\frac{1}{2}$; lesser $\frac{1}{2}$ to $\frac{3}{4}$: Lungs 2-lobed: Liver 2-lobed, each subdivided, and a lobulus: Gall-bladder grain-like (size and shape of a grain of finest rice) and freely suspended in the cleft of the largest lobe of the liver. Contents of stomachs, insect remains solely: of uteri, single young, much advanced in growth, with all the organs formed and the mouth open, but quite nude. The scull, the walls of which are as thin as paper, is much curved culmenally and very ample in dimensions in all the regions of the brain: the crests, longitudinal and transverse, small but traceable: the frontals flat, short and laterally bounded by sharp ridges: the nasals,* wanting: orbits large and very incomplete: auditory cavities double: lower jaw straight with very low condyles. Teeth $\frac{0}{4}$: $\frac{1}{1}$:$\frac{1}{1}$ $\frac{4}{5}$:$\frac{4}{5}$. No trace of incisors in the upper jaw, nor of any bone or cartilage to sup-

* The deficient bones are apparently not merely the intermaxillars but the nasals, of which there is no trace, and the cavity in front of the scull is consequently very large. However in all the 7 specimens now before me the cranial sutures are well nigh or wholly obliterated. Quere? Are not the nasal bones wanting in all the typically istiophorous Bats? for, if not, how could the complex and delicate external apparatus of the nose have the requisite freedom of communication with the nervous and circulating systems, there being no special orifaces observable in the malars or frontals. In fact, the ant-orbitar formamina are very small in these Bats, and I have noticed no others.

port them; lower incisors pressed between the canines and denticulate on their crowns: laniaries large, curved, angular, with spiculate processes before and behind at their base: molars purely insectivorous, their crowns bristling with spikes and filling the entire space from the laniaries to the posteal edge of both jaws. Tongue moderately extensile and simple.

The following are the dimensions in detail of a fine mature specimen:—

| | | | |
|---|---|---|---|
| Expanse of wings | 1 | 6 | 0 |
| Snout to vent | 0 | 3 | $\frac{1}{2}$ |
| Tail | 0 | 0 | 0 |
| Caudal membrane | 0 | 1 | $\frac{1}{2}$ |
| Head to occiput, | 0 | 1 | $\frac{1}{4}$ |
| Length of ears | 0 | 1 | $\frac{1}{2}$ |
| Width of ears | 0 | 0 | $\frac{7}{8}$ |
| Brachium | 0 | 1 | $\frac{1}{2}$ |
| Cubitus | 0 | 2 | $\frac{9}{16}$ |
| Long finger | 0 | 5 | 0 |
| Femur | 0 | 1 | $\frac{3}{8}$ |
| Tibia | 0 | 1 | $\frac{3}{8}$ |
| Planta and nails | 0 | 0 | $\frac{3}{4}$ |
| Weight | 2 oz. | | |

*On a New Species of Plecotus; by the same.*

I have just obtained, for the first time, a sample of the genus Plecotus, and one very nearly allied to the common English type so admirably described by McGillivray in the VII. Vol. of the Nat. Lib. p. 85—90. My specimen was taken in the central region of the mountains, in a dwelling house, where it was attracted at night by the lights, and after a chase of above half an hour's duration, during which the extraordinary volant powers of this Bat several times caused its

pursuers to despair of success in taking it. It flew unwearicdly, turned with the rapidity of a butterfly, and alighted and rose again as readily as that active insect. It is a male and mature.

Plecotus homochrous, mihi. Snout to vent $1\frac{7}{8}$ inches. Head $\frac{5}{8}$. Tail $1\frac{3}{4}$. Expanse 10. Weight less $\frac{1}{2}$ oz. Ears from anteal base $1\frac{1}{2}$. From posteal $1\frac{3}{8}$. Arm $1\frac{13}{16}$. Forearm $1\frac{7}{16}$. Mid finger $2\frac{5}{8}$. Femur $\frac{5}{8}$. Tibia $\frac{5}{8}$. Planta and nails $\frac{5}{16}$. Colour, uniform obscure brown. Fur, silky and short, internally black, externally brunescent above, flavescent below, but obscurely in both cases. Membranes dusky brown. Iris saturate brown. Head depressed. Nose medial, depressed, with a central groove in both skin and scull. Nares, angulo-elliptic, large, supernal, with a swollen margin. Lips simple. Eye prominent, large for a true Bat, and nearer ear than snout. Forehead not raised. Ears enormous, $2\frac{1}{2}$ of head, elliptic, nude, transversally striolate. Anteal edge of helix, half reflected, flat, smooth, and ending below in a sacculus and salient knob. Inner ear narrow, pointed, erect, with a small basal process for tragus, answering which is a small internal antitragus. Ears remote, low down, touching with proximate edges over the forehead, but *not* united there. Tongue simple and not extensile. Teeth $\frac{2:2}{6:6}$ $\frac{1:1}{1:1}$. $\frac{4:4}{5:5}$. Wings ample, the membrane commencing from shoulder almost, and taking in the wrists, first phalanx of thumb, and the metatarse as well as tarse, and enveloping all the long tail. Thumb 3 jointed. Index 1. Mid-digit 4. Annular and small each 3. Tail 7 jointed, long and pointed, the mere tip free. No teats traceable on chest or groin. Intestines $5\frac{1}{2}$ inches, thin coated and fragile, wider above, gradually narrowing. No cœcum. Stomach membranous, hemispheroidal, with terminal orifaces. $1\frac{3}{4}$ by $\frac{5}{16}$ inches along greater and lesser arches.

Habitat.—Central region of sub-Himalayas.

Remark.—Nearly allied to Auritus, but differs therefrom by disunited ears, fewer molars, a flat inner ear, shorter fur, and nude ears, besides its more uniform colour. The joints of the digits also differ, showing how little dependance can be placed upon this mark which yet Cuvier, Geoffroy and H. Smith make the corner-stone of their general classification of the Family!

I subjoin a synopsis of the several species thus far ascertained.

## VESPERTILIONIDÆ.

### Pteropinæ.

Pteropus. 1. *edwardsii v. medius.*

Cyanopterus. 1. *marginatus.*

Habitat, Terai. Passengers in Hills.

### Rhinolopinæ.

Rhinolophus. 1. *perniger.* 2. *macrotis.* 3. *tragatus.*

Hipposideros. 1. *armiger.* 2. *subbadius.*

Habitat, Central Hills.

Megaderma. 1. *schistacea.*

Habitat, Tarai.

### Vespertilioninæ.

Vespertilio. 1. *muricola.* 2. *pallidiventris.*

Kerivoula. 1. *formosa.*

Scotophilus. 1. *fuliginosus.*

Noctilinia. 1. *labiata.* 2. *lasyura.**

Plecotus. 1. *homochrous.*

Habitat, Central Hills.

Total—15 species.

* N. B. This is an undescribed species with the general structure of labiata, but distinguished remarkably by having the entire legs and caudal membrane clad in the fur of the body, which is thick and woolly. Colour bright rusty above, sooty below; the hairs tipt hoary. Digits rusty. Membranes blackish. Snout to rump $2\frac{1}{2}$ inch. Head $\frac{15}{16}$. Ears $\frac{11}{16}$. Tail $1\frac{3}{4}$. Expanse 13 inchs. Arm $1\frac{1}{8}$. Forearm $1\frac{3}{4}$. Long finger $3\frac{1}{4}$. Head depressed. Eyes and ears remote. Eyes small. Ears moderate rounded. Inner ears spire-shaped. Nostrils lateral-salient. Cheeks tumid. Thumb with 3 joints. Index with 2. Mid with 4 and a cartilaginous appendix. Annular and small digits each with 3. Tail ample, 7 jointed, and nearly square. Teeth all remarkably blunt. Penis with a corneous tip ending in two horn-like crura. Helix posteally with a sacculate reduplication, but no prolongation towards the gape as in labiata. Intestines $7\frac{1}{2}$ inches. No cœcum. Stomach hemispheroidal with terminal orifaces.

# CATALOGUE OF REPTILES

*Inhabiting the* MALAYAN PENINSULA *and* ISLANDS,

*Collected or observed by* THEODORE CANTOR, *Esq., M. D., Bengal Medical Service.*

(Continued from No. CLXXX.)

## OPHIDIA.

### INNOCUOUS SERPENTS.

### FAM. TYPHLOPIDÆ, GRAY.

---

#### BURROWING.

GEN. PILIDION, *Duméril and Bibron.*

Head covered with shields, cylindrical, very short, as if truncated, convex above, declivous in front; muzzle rounded; rostral shield like a large rounded cap covering the head and muzzle; an anterior frontal, a frontal, a pair of supra-orbital-, ocular-, nasal-, and fronto-nasal shields; neither parietals, inter-parietals, nor præ-orbitals; nostrils hemispherical, under the muzzle, between the nasal-and fronto-nasal shields; eyes excessively small, hidden by the ocular shields.

PILIDION LINEATUM, (Boie.)

SYN.—Acontias lineatus, Reinwardt, MS.
Typhlops lineatus, H. Boie.
Typhlina, Wagler.
Typhlops lineatus, Gray in Griffith, A. K.
Typhlops lineatus, Schlegel.
Pilidion lineatum, Duméril and Bibron.
Typhlinalis lineatum, Gray: Catal.

Ground-colour pale gamboge or orange, uniform on the head, the apical third of the tail, and the abdomen; interrupted on the back and sides by 12 longitudinal, serrated brown lines, produced by a minute triangular spot on each side of the scales.

HABIT.—*Pinang Hills.*

Java, Sumatra, Singapore.

A single individual, captured by Sir William Norris, differs from the description given by M. M. Duméril and Bibron in the comparatively

greater dimensions of the tail. It is strongly arched; its length equals twice the breadth of the head; it is covered with 16 transversal series of scales, and it is considerably thicker than the rest of the uniformly cylindrical body. The anterior frontal shield is very broad, larger than the frontal. It was of the following dimensions:—

| | | | |
|---|---|---|---|
| Length of the head, ..... | 0 feet | $0\frac{2}{8}$ | inch. |
| Ditto ditto trunk, ..... | 1 | $0\frac{7}{8}$ | |
| Ditto ditto tail, ..... | 0 | $0\frac{4}{8}$ | |
| | 1 ft. | $1\frac{5}{8}$ | inch. |

Circumference of the trunk $\frac{5}{8}$ inch; of the tail $\frac{6}{8}$ inch.

GEN. TYPHLOPS, *Schneider.*

Head covered with shields, depressed; muzzle rounded, covered above and beneath by the rostral shield; an anterior frontal, a frontal, a pair of supra-orbitals, one or two pairs of parietals and inter-parietals; a pair of nasals, fronto-nasals, præ-orbitals and oculars; nostrils lateral, hemispherical, opening in the suture between the nasal and fronto-nasal; eyes lateral, more or less distinct; pupil round.

TYPHLOPS NIGRO-ALBUS, Duméril and Bibron.

SYN.—Argyrophis bicolor, Gray: Catal.

Shining black above; on the head some transversal and radiating whitish yellow lines; scales of the back edged with white; beneath whitish yellow.

HABIT.—*Pinang Hills, Singapore.*

Sumatra.

This species is closely allied to *T. diardi*, Schlegel,* an inhabitant of Assam and the Khassia Hills. Of two individuals observed, the larger was of the following dimensions.

| | | | |
|---|---|---|---|
| Length of the head, ..... | 0 feet | $0\frac{4}{8}$ | inch. |
| Ditto ditto trunk, ..... | 1 | 0 | |
| Ditto ditto tail, ..... | 0 | $0\frac{3}{8}$ | |
| | 1ft. | $0\frac{7}{8}$ | inch. |

Circumference of the trunk $\frac{7}{8}$ inch, of the tail $1\frac{1}{8}$ inch.

* SYN.—*T. diardii*, apud Dum. and Bibr.—*Argyrophis horsfieldii*, Gray: Catal.

### Typhlops braminus, (Daudin.)

Syn.—L'Orvet lombric, Lacépède.
Anguis. Rondoo Talooloo Pam. Russell, I. Pl. 43
Punctulated Slow-Worm, Shaw.
Eryx braminus, Daudin.
Typhlops rondoo talooloo, Cuvier.
Tortrix russelii, Merrem.
Typhlops braminus, apud { Cuvier. Fitzinger. Gray in Griffith, A. K.
Typhlops russellii, Schlegel.
Typhlops braminus, Cuvier, apud Duméril and Bibron.
Argyrophis bramicus, Gray: Catal.

Shining copper-coloured, or brown of various shades above, paler beneath. Some individuals of a uniformly bluish white. All the scales with a dark brown spot at the anterior part. The shields of the head have a whitish line close to their margins. In the young the latter is crenulated, and the sides of the head, lips, throat, the anal region, and the point of the tail are yellowish or whitish, and the body is semitransparent.

Habit.—*Pinang, Singapore, Malayan Peninsula.*
Canton-Province, Philippines, Guam (Marian Isles,) Java, Tenasserim, Bengal, Assam, Coromandel, Ceylon, Malabar.

In the Malayan countries this species is numerous in hills and valleys. The eyes are black, the pupil round, which is also the case in *T. nigro-albus*. The largest of a great number examined was of the following dimensions:—

| | | |
|---|---|---|
| Length of the head, ..... | $0\frac{3}{8}$ | inch. |
| Ditto ditto trunk, ..... | $7\frac{2}{8}$ | |
| Ditto ditto tail, ..... | $0\frac{1}{8}$ | |
| | $7\frac{6}{8}$ | inch. |

Circumference of the neck $\frac{4}{8}$ inch; of the tail $\frac{5}{8}$ inch.

---

The preceding species of this family are all of similar habits. They mostly live under ground, but appear occasionally in shady places, particularly after showers of rain, in Bengal, in the rainy season. They are very agile, and appear to make use of the horny point of the tail as a propeller. When taken, they frequently press it against the hand in their attempts to escape. Reposing on the ground *Typhlops bra-*

*minus* may easily be mistaken for an earthworm, until its serpentine movements, the darting of the white furcated tongue, while the head and neck are raised, make it known. In confinement they refuse food and water. In all dissected, the stomach contained some earth; in a few, remains of insects, (myriapoda, ants.) A young female had a string of six cylindrical soft eggs, of a yellowish white colour, each about $\frac{2}{8}$ of an inch in length, $\frac{1}{16}$ in diameter.

---

## FAM. BOIDÆ, Bonaparte.

## BURROWING.

### Gen. Cylindrophis, *Wagler.*

Scales smooth, imbricate, hexagonal; those of the abdomen broader than the rest; nostrils subvertical, opening in the lower part of the anterior frontal shield; neither nasals, frenals, nor præ-orbitals; a single post-orbital; frontals large, reaching the minute eye, and the large 2nd and 3rd labials; supra-orbitals, occipitals and vertical distinct; tail very short.

### Cylindrophis rufus, (Laurenti.)

Syn.—Anguis rufa, Laurenti, apud { Gmelin. Schneider. Shaw.

Anguis striatus, Gmelin.

Anguis scytale, Linné, apud Russell, II. Pl. 27.
Shilay Pamboo, Russell, II. Pl. 28 (young.)
Anguis corallina, Shaw.
Eryx rufa, Daudin.

Tortrix rufa, Merrem, apud { Gray. Schinz. Schlegel. Filippi.

Scytale scheuchzeri, Merrem.
Ilysia rufa, Lichtenstein, apud Fitzinger.
Cylindrophis resplendens, Wagler.
Cylindrophis rufa, Gray, apud Duméril and Bibron.

Iridescent blackish brown above, beneath with alternate black and yellowish white transversal bands or interrupted bars. Iris black, pupil vertically contracted by the light; tongue whitish. Central series of abdominal scales 206; subcaudal 6.

Habit.—*Singapore.*

Java, Tranquebar, Bengal. (?)

A single individual, turned up with the earth in a garden at Singapore belonging to Dr. Montgomerie, differs from the description

given by M. M. Duméril and Bibron in the following particulars. The head is uniformly black, without the two scarlet frontal spots; the apex of the tail whitish; the posterior part of the body is more robust than the anterior; the length of the head forms more than $\frac{1}{18}$ of the entire length of the animal; there are six pairs of labial shields on each jaw, and the scales of the trunk are disposed in 20 longitudinal series. It unites characters assigned by M. M. Duméril and Bibron as distinguishing *Cylindrophis rufus* from *C. melanotus*, Wagler, and it would therefore appear that Dr. Schlegel is justified in considering the latter from Celebes (*Tortrix melanota*, Boie, MS.) as a variety of *rufa*. In the present individual there is no external appearance of the very rudimentary anal hooks. It was slow in its movements, attempted to escape, but not to bite.

| | | |
|---|---|---|
| Length of the head, ..... | 0 feet | $0\frac{1}{8}$ inch. |
| Ditto ditto trunk, ..... | 1 | $6\frac{2}{8}$ |
| Ditto ditto tail, ..... | 0 | $0\frac{3}{8}$ |
| | 1 ft. | $7\frac{1}{8}$ inch. |

### Gen. Xenopeltis, *Reinwardt.*

Head rather narrower than the trunk, depressed, obsolctely angular; eyes small, round; nostrils large, apical; frenal shield very large; præ-orbital none;* post-orbitals three;† interparietal very large, equalling the vertical; trunk thick, short with imbricate smooth hexagonal scales, disposed in longitudinal series, increasing in size towards the narrow abdominal scuta; tail thick, short, awl-shaped, beneath with scutella.

### Xenopeltis unicolor, Reinwardt.

Syn.—Xenopeltis concolor, Reinwardt.
Xenopeltis leucocephala, Reinwardt (young.)
Guerin: Iconog. Pl. 21, Fig. 3.
Tortrix xenopeltis, Schlegel.

*Adult.*—Blackish or reddish brown above with strong metallic blue, purple, and green lustre; lips and throat buff; the lowest lateral series

* The single præ-orbital is very large, the frenal small, sub-rectangular; the nostrils open between the latter and the nasal shield.

† Three individuals examined, presented two post-orbitals.

of scales, scuta and scutella pale reddish brown with broad whitish margins. Iris black ; pupil lanceolate with the apex downwards, vertically contracted by the light ; tongue buff.

*Young.*—Head yellowish white with a brown spot on the crown and labial shields ; the scales of the sides edged with white, producing longitudinal zig-zag lines ; the two lowest series of scales and scuta yellowish white ; scutella of the same colour with a brown transversal line.

Scuta 175 to 179, Scutella 26 to 27.

Habit.—*Pinang, Singapore, Malayan Peninsula.*

Celebes, Java, Sumatra.

Of three young individuals, one was found by Sir William Norris on the Great Hill at Pinang, a second by Dr. Montgomerie at Singapore, and a third was obtained in Province Wellesley, where also a single adult male was killed. As this serpent in general appearance bears a strong resemblance to *Lycodon aulicus*, (Linné) (Syn. *L. hebe*, apud Schlegel), so it also does in its fierce habits, and mode of attack. The scales are smooth, rhombic-hexagonal, disposed in 15 longitudinal series. Labial shields $\frac{8-8}{8-8}$. The stomach of a young individual examined, contained the remains of a rat. The adult attains to a much larger size than supposed : a male was of the following dimensions :

| | | | |
|---|---|---|---|
| Length of the head,..... | 0 feet. | $1\frac{4}{8}$ | inch. |
| Ditto ditto trunk,..... | 3 | $2\frac{3}{8}$ | |
| Ditto ditto tail, ..... | 0 | 4 | |
| | 3 ft. | $7\frac{7}{8}$ | inch. |

Circumference of the neck $2\frac{6}{8}$, of the trunk $4\frac{2}{8}$, of the root of the tail 2 inch.

## TERRESTRIAL.

### Gen. Python, *Daudin.*

Entire shields under the abdomen and tail, the latter cylindrical, sometimes with scutella ; anus with scales and a hook on each side.

### Python reticulatus, (Schneider.)

Syn.—Seba I, Tab. 62, Fig. 2 ; II. Tab. 79, Fig. 1. and Tab. 80. Fig. 1.
Ular sawa, Wurmb.
La jaune èt bleue Lacépède.
L'oularsawa, Bonnaterre.
Boa reticulata, Schneider, apud Daudin.
Boa rhombeata, Schneider. (?)

Boa amethystina, Schneider.
Boa constrictor, Var c, Latreille.
Boa phrygia; Shaw.
Coluber javanicus, Shaw.
Boa constrictor, Var 5, Daudin
Python amethystinus, Daudin.
Python des îsles de la Sonde.
Python schneiderii, Merrem, apud { F. Boie. Guerin Schlegel.
Coluber javanensis, Fleming.
Python javanicus,* Kuhl, apud { Fitzinger. Gray in Griffith, A. K Eichwald.
Constrictor (P. schneideri, Khul) Wagler.
Python reticulatus, Gray, apud Duméril and Bibron.
"Ular sawa" of the Malays

Ground-colour above light yellowish-brown, chestnut or olive-green, assuming a greyish hue on the sides, all the colours strongly iridescent, particularly reflecting metallic blue, or green. The head is divided from the muzzle to the nape of the neck by a black line, continued along the back to the point of the tail and describing a series of large lozenges, sometimes linked to each other by a small black ring, sometimes broken up into large irregular patches. A black oblique line proceeds from behind the eye towards the angle of the mouth, continuing on the sides as a series of more or less regular lozenges, which are joined to the lateral angles of those of the back by a large black triangular spot with a white arched mark in the centre. The scales nearest the black margins of the lozenges are of a lighter colour than the rest, sometimes whitish. Between and within the lateral lozenges appear numerous black spots, or interrupted lines. The lips (the lower in some present a black line), and abdominal scuta are gamboge, or pale yellow, as well as the lowest two or three series of scales, but the latter with irregular black spots. The caudal scutella, and scuta, when present, are yellow, marbled with black. The iris is silvery flesh-coloured or yellowish-brown, sometimes with a black bar; the pupil vertically contracted by the light. The tongue is black above, bluish white beneath. In the young the colours are brighter than in the adult.

Scuta 297 to 330; Scutella 82 to 102.

* *Pytho javanicus*, figured and described in *Abel's Narrative*, &c., is *Python molurus*, (Linné.)

Habit.—*Malayan Peninsula and Islands.*

Chusan ?* Amboina, Java, Banka, Sumatra, Bengal ? ☞

The two fossets of the rostral shield are pyriform with the apex diverging, and those of the nearest 3 or 4 upper labials are of similar shape. The inferior fossets are square, occupying the lower margin of the shield, varying from 7 to 9 on each side. The foremost of these is situated on the shield corresponding to that of the upper jaw, which borders the orbit.

This species is very numerous in the Malayan hills and valleys, feeding upon quadrupeds and birds. It often takes up its abode in outhouses, preying at night, and is thus useful in destroying vermin, although plunder is occasionally committed in poultry yards. Dr. Montgomerie has seen in George Town, Pinang, a young one which the inhabitants suffered to retain unmolested possession of the rice stores in order to secure them against the ravages of rats. Individuals of 16 ft. in length are of no rare occurrence. In 1844 one was killed at the foot of Pinang, which a gentleman informed me measured more than 30ft. During the expedition to China in 1840 one was shot from the poop of one of H. M. Transports, then riding in Singapore roads, between 3 and 4 miles from the shore. It was about 9ft. long, and had the upper part of the head infested with *Ixodes ophiophilus*, Müller. The Chinese attribute great medicinal qualities to the heart and the gall-bladder, and use the skin to cover the bodies of some of their musical instruments. *Python molurus*, (Linné,) *Pedda Poda*, Russell, I. Pl. 22, 23, 24, and *Bora*, Pl. 39, is said also to occur, but rarely, in the Malayan Peninsula, but I never had an opportunity of seeing it.

* Skins are of frequent occurrence at Chusan, and the natives assert that the serpent is found there and on the neighbouring continent. Serpents from 14 to 16 feet in length, "Rock-snakes," were observed by several officers during our occupation of the island.

☞ M. M. Duméril and Bibron state that this species has been sent from Bengal by M. A. Duvaucel. The natives are not acquainted with it, and the specimens in the Museum of the Asiatic Society are from Pinang. The living animal is occasionally brought from the Straits of Malacca to Calcutta, and such is probably the history of the specimen sent from Bengal by M. Duvaucel. *Python molurus*, (Linné,) (*Pedda Poda* and *Bora* of Russell,) is very numerous in Bengal.

## AQUATIC.

### Gen. Acrochordus, *apud Schlegel.*

(*Acrochordus*, Hornstedt, 1787.—*Chersydrus*, Cuvier, 1817.)

*Acrochordus*, Hornstedt. Nostrils vertical, eyes encircled by a ring of minute scales; trunk compressed, attenuated towards both extremities; tail tapering, compressed; all the scales small, trifid, strongly keeled.

### Acrochordus javanicus, Hornstedt.

Syn.—Acrochordus javanicus, apud Shaw.
Acrochordus javensis, Lacép. apud Cuvier.
Acrochordus javanicus, apud Schlegel.
"U'lar károng, or sápi, or lembu" of the Malays.*

*Young.* Above dull greyish-brown; sides and lower parts pale yellow, or dirty ochre; back with 3 longitudinal, undulating, frequently interrupted black bands; sides and abdomen with rows of rounded spots, marbled and dotted with black.

*Adult.* Of similar, but less distinct colours. Iris brown, pupil elliptic, vertically contracted by the light; tongue whitish.

Habit.—*Pinang, Singapore.*

Java.

A female captured on the Great Hill at Pinang, at a distance from water, was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, .... .... | 0 ft. | $1\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | 4 | 7 |
| Ditto ditto tail, ..... . | 0 | 9 |
| | 5ft. | $5\frac{4}{8}$ inch. |

Greatest circumference one foot.

Notwithstanding the sharply compressed abdomen, the serpent moved without difficulty, but sluggishly on the ground, and preferred quiet. When touched she attempted to bite, but the pupil being contracted by the glare, she missed her aim. Shortly after being brought, while the rest of the body remained motionless, the posterior ribs were observed moving, and the serpent successively, in the course of about 25 minutes, brought forth twenty-seven young ones. Each birth was

* *U'lar* signifies a serpent, *károng* a sac; *sápi* and *lembu* a cow or ox. These expressive vernacular names refer to the loose skin, and the bulk of the animal.

followed by some sanguinolent serum. With two exceptions the fœtus appeared with the head foremost. They were very active, bit fiercely, and their teeth were fully developed. Shortly after birth the integuments came off in large pieces, which is also the case with the fœtus of several species of *Homalopsis*. The present ones were placed in water, which however appeared to distress them, as they all attempted to escape on dry ground. Nearly all were of the following dimensions :

| | | | |
|---|---|---|---|
| Length of the head, ..... | 0 ft. | $0\frac{6}{8}$ | inch. |
| Ditto ditto trunk, ..... | 1 | $1\frac{2}{8}$ | |
| Ditto ditto tail, ..... | 0 | 3 | |
| | 1ft. | 5 | inch. |

The Malays of Pinang assert that this species is of very rare occurrence. During a residence of 20 years at Singapore, Dr. Montgomerie observed it but in a solitary instance. The physiognomy of this species bears a striking resemblance to that of a thorough-bred Bull-dog, which in a somewhat less degree also may be said of the following.

*Sub-Gen. Chersydrus*,* Cuvier. Head and body uniformly covered small scales.

### Acrochordus granulatus, (Schneider.)

Syn.—Hydrus granulatus, Schneider.
Angvis granulatus, Schneider.
Acrochordus fasciatus, Shaw.
Acrochordus dubius, Shaw.
Pelamis granulatus, Daudin.
Chersydrus (A. fasciatus, Shaw), Cuvier.
Acrochordus fasciatus, apud Raffles.
Chersydrus granulatus, Merrem, apud Wagler.
Acrochordus fasciatus, apud Schlegel.
" U'lar limpa," ☞ or " U'lar lant" of the Malays.

*Young.* Blackish-brown or liver-coloured ; the head with a few scattered yellowish-white spots, the rest of the body with numerous rings of the latter colour, some interrupted on the back, others on the abdomen.

* This Sub-Gen. was founded upon the erroneous supposition that *Acrochordus fasciatus*, Shaw, possessed venomous organs.

☞ *Limpa*, i. e. liver, liver-coloured.

*Adult*. The dark colours fade to a dull greyish black, uniform on the back, and the sides and abdomen present alternate dark and whitish vertical bands. Iris black, pupil vertically contracted; tongue whitish.

Habit.—*Rivers and sea-coast of the Malayan Peninsula and Islands.* Bay of Manilla, New-Guinea, Timor, Java, Sumatra, Coromandel.

This species appears not to exceed about 3ft. in length. The body is less bulky and the skin less loose than in *A. javanicus*. But the form is more compressed, particularly the sword, or oar-like tail, and like that of the pelagic venomous serpent, appears exclusively calculated to aquatic habits. The scales also resemble those of the latter, and are generally smaller than in *A. javanicus*. Those of the back, the largest, are rounded rhombic, each with a minute tubercle in the centre. The skin in the interstices is finely wrinkled. On the abdomen the scales are mucronate, with a sharp, reclining central point. In both species the medial line is raised by 2 or 3 quincunx rows of scales with their points overlapping each other. The orbit is surrounded by a ring of scales a little larger than the rest. The nostrils, pierced high up on the muzzle, are almost vertical, slightly more so than they are in *A. javanicus*. In both they are tubular, larger in the present species, sinuous, and provided with a deeply seated membranous fold, which can hermetically close the passage. The mouth is secured in a similar manner by a central arched notch and two lateral protuberances, which correspond to a protuberance and two lateral cavities in the lower jaw. This contrivance also occurs in *Hydrus*, and to a certain extent in *Homalopsis*. With the exception of the dentition and the absence of venomous organs, in anatomical details both species of *Acrochordus* closely resemble *Hydrus*. As observed by M. Schlegel, the most striking feature is the great development of the lung, which occupies nearly three-fourths of the extent of the abdominal cavity. A somewhat similar arrangement also occurs in *Homalopsis*. All the maxillary teeth (inter-maxillary none) are strong, pointed, inwardly reclining and disposed in double or treble rows. The 3 anterior teeth are the shortest: the upper jaw has on each side upwards of 20 teeth, the lower 3 or 4 less. The palatal teeth number 12 on each side, the pterygoid 9, and are shorter than the rest. *Acrochordus granulatus* is of no rare

occurrence in the sea of the Malayan coasts, although, according to Raffles, it is rarely seen on the coasts of Sumatra. At Pinang they are found among the fishes, taken in the stakes some 3 or 4 miles distant from the coast. M. Schlegel is mistaken in stating that this species never inhabits the sea,* and in censuring M. Eschscholtz for his stating that the fishermen often take it in the Bay of Manilla. A female of the following dimensions had six eggs:—

| | | |
|---|---|---|
| Length of the head, ..... | 0 feet | $0\frac{6}{8}$ inch. |
| Ditto ditto trunk, ..... | 2 | $7\frac{2}{8}$ |
| Ditto ditto tail, ..... | 0 | $3\frac{6}{8}$ |
| | 2 ft. | $11\frac{6}{8}$ inch. |

Greatest circumference, 4 inches.

The egg is cylindrical, soft, coriaceous, whitish, about $1\frac{1}{2}$ inch in length. In each egg was coiled up a living young one of the following dimensions:

| | |
|---|---|
| Length of the head, ..... | $0\frac{3}{8}$ inch. |
| Ditto ditto trunk, ..... | 9 |
| Ditto ditto tail, ..... | $1\frac{4}{8}$ |
| | $10\frac{7}{8}$ inch. |

Greatest circumference, 1 inch. In food and general habits this species resembles the pelagic, venomous, serpents; in its element, it is active, but on dry, blinded by the daylight, it is sluggish and of uncertain movements.

## FAM. COLUBRIDÆ, Bonaparte.

### TERRESTRIAL.

#### Gen. Calamaria, *H. Boie.*

Body diminutive, elongated, obtuse at both extremities, throughout of equal diameter, cylindrical; eyes very small with round pupil; frontals one pair, laterally extending to the labials; frenals none; nostrils lateral, opening in a small shield between the frontal, rostral and anterior labial; one præ-orbital, one post-orbital, four mental shields; dorsal scales rhombic, polished, smooth; tail very short.

##### Calamaria lumbricoidea, Schlegel, Var.

Syn.—Calamaria lumbricoidea, Boie, MS.
Calamaria virgulata, Boie, MS. (Young.)

* *Essai*, &c. p. 492.

Strongly iridescent, brownish-black, lighter on the head, scales with whitish edges; cheeks, lips and throat citrine; the lowest row of scales and abdominal surface yellowish white; sub caudal scutella faintly marked with brown; eyes and tongue black.

Scuta 169; Scutella 26.

Habit.—*Pinang, Singapore.*

Celebes, Java.

This variety differs in nothing but colours from the species described by M. Schlegel. Of three individuals observed, two were taken by Sir W. Norris and W. T. Lewis, Esq. in the hills of Pinang, the third by Dr. Montgomerie at Singapore. The largest was of the following dimensions:

| | |
|---|---|
| Length of the head, ..... | $3\frac{3}{8}$ inch. |
| Ditto ditto trunk, ..... | $11\frac{6}{8}$ |
| Ditto ditto tail, ..... | $1\frac{3}{8}$ |
| | 1 ft. $1\frac{4}{8}$ inch. |

Circumference $\frac{6}{8}$ inch.

The livery bears a remarkable resemblance to that of *Calamaria alba* (Linné), (*C. brachyorrhos*, Schlegel,) from which it however differs in the absence of the anterior frontal shields, and in having 13 instead of 17 longitudinal series of scales.

Calamaria linnei, H. Boie, Var. Schlegel.

Syn.—Calamaria reticulata, Boie, MS.?
Changulia albiventer, Gray: Ill. Ind. Zool. Pl.—Fig. 6—9.*
Calamaria linnei, Vár Schlegel.

*Adult.* Head brown, minutely dotted with black, lips and cheeks pale gamboge; trunk reddish brown, on each side with two vermillion longitudinal bands with black serrated edges; beneath carmine with a black serrated line on each side; subcaudal scutella with a central black, zig-zag line; all the colours strongly iridescent; eyes black, tongue vermilion.

*Young.* Like the adult, but with a broad black nuchal band, edged

* Referred by M. Schlegel to *C. lumbricoidea*, but the characteristic distribution of the colours is that of the present *Var.* The figure however is not good, and not coloured from life.

with white, a vermilion band at the root of the tail, and in some a similar near the point.

Scuta 166, Scutella 17.

Habit.—*Pinang.*

Java.

The present variety corresponds in all particulars to the description of *C. linnei* by M. Schlegel, who however does not mention that the two or three anterior teeth on each side of the lower jaw are longer than the rest. Of six individuals from the hills of Pinang the largest individual measured

| | |
|---|---|
| Length of the head, | $0\frac{2}{8}$ inch. |
| Ditto ditto trunk, | $10\frac{1}{8}$ |
| Ditto ditto tail, | $0\frac{5}{8}$ |
| | 11 inch. |

Circumference of the neck $\frac{3}{8}$, of the trunk $\frac{4}{8}$ inch.

Calamaria longiceps. n. s. (See plate, Fig. 1.)

Strongly iridescent soot-coloured, a shade lighter beneath ; the scuta and scutella edged with whitish. Eyes and tongue black.

Scuta 131, Scutella 26.

Habit.—*Pinang.*

The head is elongated, narrow, conical, the muzzle rounded, projecting over the lower jaw. The anterior frontals are much smaller than the frontals, which on the sides occupy the place of the absent frenal shield, and thus reach the second upper labial ; the nasal is very small, rectangular, perforated by the rather large nostril near the lower anterior angle. The eye is comparatively large, between an obliquely placed rectangular præ-orbital, and a similar post-orbital shield ; the supra-orbitals are narrow, rectangular ; the vertical moderate, pentagonal, arched and somewhat narrowed at the anterior margin. The occipitals, the largest, are elongated, bordered below by the large fifth upper labial, and behind by a single pair of post-occipitals. Each jaw has 5 pairs of labials. Of the 2 pairs of mentals, the anterior is the longer, and is enclosed by the rostral and 3 anterior labials, the posterior pair, by the fourth labial. The teeth are minute, sharp, reclining, all of equal size. The trunk is cylindrical, narrowed towards

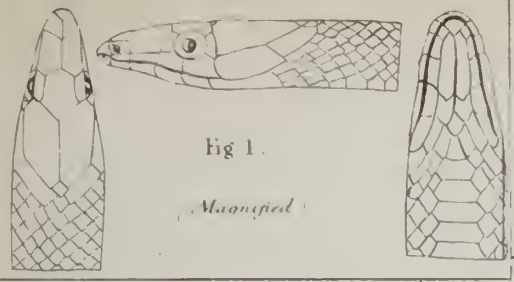


Fig 1.

( Magnified )

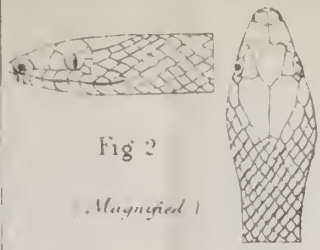


Fig 2

( Magnified )

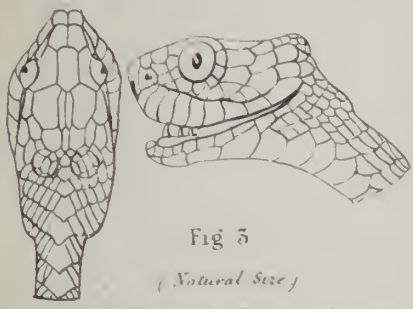


Fig 3

( Natural Size )

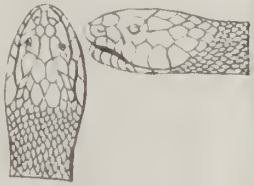


Fig. 4.

( Natural size

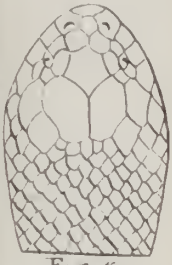


Fig. 5.

( Natural size

Fig. 6.

Natural size )

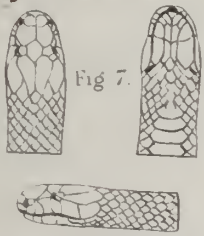


Fig 7.

Natural size

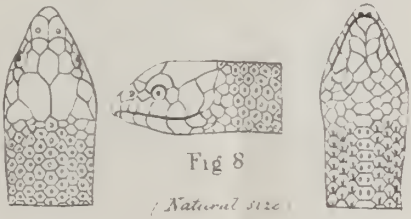


Fig 8

( Natural size )

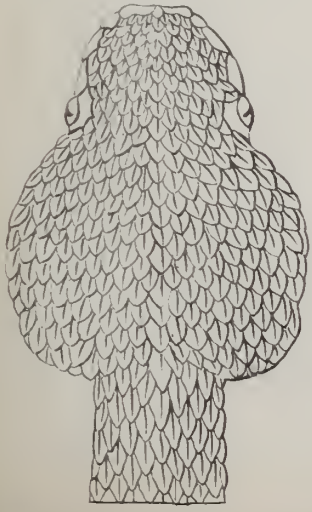


Fig. 9

( Natural size )

both extremities, covered with 15 longitudinal series of smooth, rhombic, imbricate scales. The abdomen is arched, the short tail tapering to a blunt point. This species approaches to *Calamaria alba* (Linné), (*C. brachyorrhos*, Schlegel), but differs by its elongated shape of the shields of the head, and its larger eyes. A single individual, captured by W. T. Lewis, Esq., on the Great Hill of Pinang, was of the following dimensions :

| | |
|---|---|
| Length of the head, ..... | $0\frac{3}{8}$ inch. |
| Ditto ditto trunk, ..... | 5 |
| Ditto ditto tail, ..... | $0\frac{6}{8}$ |
| | $6\frac{1}{8}$ inch. |

Circumference of the trunk $\frac{9}{16}$, of the neck $\frac{3}{8}$, at the root of the tail $\frac{3}{8}$ inch.

### Calamaria sagittaria.

Syn.—Calamaria sagittaria, Cantor : Spicil.

Head yellow or white, marbled with black, forming a streak above the citrine lips ; neck white with a black arrow-shaped mark ; back partly ash, partly rust-coloured, with a medial series of distant minute black spots ; sides bluish-black or grey, with a narrow black line above ; beneath citrine, the throat marbled with black, and with a minute black spot near the lateral angle of each scutum. Iris golden, tongue carmine.

Scuta 216 to 227 ; Scutella 57 to 70.

Habit.—*Malayan Peninsula.*
Bengal, Assam.

But for the diminutive size, and the reduced shields of the head and throat, this species might be taken for a *Coronella*. The head is but little distinct, depressed, ovate, covered by the normal number of shields. The anterior frontals are very small, pentagonal ; the frenal short rectangular. The nostrils are rather large, piercing the middle of the nasal. The eyes are large, prominent with one præ-orbital, two post-orbitals ; the upper jaw, but slighly longer than the lower, has on each side 6 labials, the lower 7, enclosing two pairs of small mentals. The temples are covered by three shields. The trunk, with 17 longitudinal series of smooth, rhomboidal imbricate scales, is slightly thick-

er towards the middle than at the extremities; the back throughout depressed, forming an angle with the sides, and the abdomen is flat, which makes a vertical section of the body square. The tail is very slender, tapering to a sharp point, and exceeds one-fifth of the entire length. The teeth are very minute, of equal size. A single specimen from the Malayan Peninsula was of the following dimensions:

| | |
|---|---|
| Length of the head, ..... | $0\frac{2}{8}$ inch. |
| Ditto ditto trunk, ..... | $9\frac{3}{8}$ |
| Ditto ditto tail, ..... | $2\frac{2}{8}$ |
| | $11\frac{7}{8}$ inch. |

Circumference of the trunk: $\frac{4}{8}$, of the neck and root of the tail $\frac{3}{8}$ in.

In Bengal this species is of no uncommon occurrence, particularly during the rainy season, when the water compels the serpents to leave the shady recesses which most of them occupy to avoid the heat of the day. The present species appears to be closely allied to the African *C. arctiventris*, Schlegel.

---

Of the preceding four species, the three first appear at Pinang exclusively to inhabit the hills, but the variety of *C. lumbricoidea* occurs at Singapore in valleys. They are nowhere to be met in numbers. They are of gentle peaceable habits, never attempting to bite, and scarcely to escape. They are sluggish, move but slowly, and to a short distance, even when compelled by danger, and soon resume the motionless position which they appear to affect. The remarkable abstinence of most of their congeners, they possess but in a very limited degree. In captivity they refuse food, and soon expire; besides, they are so delicate, that slight pressure in examining them, is sufficient to kill them. Their bodies are very smooth, and brilliantly reflect rain-bow-colours, which continue in preserved specimens, long after the gay livery has faded. They feed upon slugs, earth-worms, and insects. The stomach of a *C. sagittaria* contained remains of an *Iulus* and some sand. In general appearance, and habits these species of *Calamaria* strongly resemble the Malayan *Elaps* (vide infra.)

---

GEN. CORONELLA, *Laurenti*.

Head above covered with large plates, of which one between the eyes;

sides of the head and occiput with imbricate scales; trunk narrowed near the head, thicker towards the middle; tail conical, elongated, tapering to a sharp point.

### Coronella baliodeira, Schlegel.

Syn.—Patza Tutta, Russell I. Pl. 29?
Coluber pictus, Daudin?
Coluber plinii, Merrem?
Coronella baliodeira, Boie MS.

Above lighter or darker olive brown, yellowish on the head, the scales minutely dotted with dark brown; the anterior part of the trunk with a number of distant transversal ocellated lines, composed of single transversal series of white scales, edged with black, labial shields yellow edged with black; beneath pearl coloured or yellowish white; iris golden, lower half blackish; tongue black.

Scuta 122 to 132; Scutella 65 to 72.

Habit.—*Pinang.*
Java.

Of two individuals from the hills of Pinang, the larger was of the following dimensions:

| | |
|---|---|
| Length of the head, ..... | $0\frac{5}{8}$ inch. |
| Ditto ditto trunk, ..... | $8\frac{5}{8}$ |
| Ditto ditto tail, ..... | $3\frac{6}{8}$ |
| | 1ft. 1 inch. |

Circumference of the neck $\frac{4}{8}$, of the trunk $\frac{7}{8}$, of the root of the tail $\frac{5}{8}$ inch.

Both agree with the description of M. Schlegel, except in having two small præ-orbitals instead of one. Russell's No. 29, from Casemcottah, which according to M. Schlegel is *Coluber pictus*, Daudin, *C. plinii*, Merrem, is probably intended to represent the present species. It is of fierce habits.

### Gen. Xenodon, *H. Boie.*

Head scarcely distinct, muzzle obtuse, nostrils rounded, between 3 shields; eyes encircled behind only by 3 shields; trunk short robust; tail rather short slowly tapering; 4 very large mentals, the last upper maxillary tooth the longest.

Xenodon purpurascens, Schlegel.

Syn.—Coronella albocincta, Cantor, (Var.)

Above olive brown with black spots, and numerous pale red transversal zig-zag bands, each with a submarginal black line. The first occupies the space between the eyes, continuing obliquely backward over the cheeks and lips; the second, arrow-shaped, diverging over the neck; labial shields yellow with brown margins. Beneath strongly iridescent pale carmine; every other scutum entirely or partially black near the lateral angles. Iris circular, golden, lower half dotted with black; tongue black.

Scuta 179 to 183; Scutella 36 to 65.

Habit.—*Pinang.*

Java, Tenasserim, (Var) Chirra-Punji, Assam, Darjeling, Midnapore (Bengal.)

A solitary individual observed on the summit of the Great Hill of Pinang, defended itself vigorously. The dimensions were:

| | | | |
|---|---|---|---|
| Length of the head, ..... | 0 ft. | 1 | inch. |
| Ditto ditto trunk, ..... | 1 | $8\frac{3}{8}$ | |
| Ditto ditto tail, ..... | 0 | $3\frac{5}{8}$ | |
| | 2 ft. | 1 | inch. |

Circumference of the neck, $1\frac{4}{8}$, of the trunk 2, of the root of the tail $1\frac{1}{8}$ inch. It differs from the description of M. Schlegel in having 21 longitudinal series of scales instead of 19, and on the right side 3 præ-orbitals. Labials on each side $\frac{8}{10}$. The Variety described as *Coronella albocincta* inhabits Assam, Chirra Punji, Darjeling, and Midnapore (Bengal.) It differs from those of the southern localities in having the head not distinct from he trunk, and its shields are shorter. The eyes are smaller, and, owing to the much swollen cheeks, appear sunk, which with the remarkably shelving profile, contribute to render the physiognomy singularly scowling. The largest specimen in the Museum of the Asiatic Society measures in length 2 feet $5\frac{3}{8}$ inch., of which the head $\frac{6}{8}$, the trunk 2 feet $1\frac{5}{8}$, and the tail 3 inch. In all, the livery is individually varying, but the arrow-shaped mark, double in some, appears to be constant. Labials on each side $\frac{7}{9}$.

Gen. Lycodon, *H. Boie.*

Head not very distinct, oblong, depressed; supra-orbital shield triangular, narrowed in front; præ-orbital one; post-orbitals two; frenal one; eyes sunk, far removed from the muzzle; pupil vertical; trunk elongated, somewhat compressed with smooth, rhomboidal, imbricate scales; tail short, tapering: anterior maxillary teeth longer than the rest.

Lycodon aulicus, (Linné.)

Lyn.—Coluber aulicus, Linné (not apud Daudin.)
Russell* I, Pl. 16, Gajoo Tutta.
Coluber striatus, Shaw?
Coluber malignus, Daudin.
Lycodon hebe, Boie, apud Wagler, Schlegel (*excl. Synon. Col. hebe, Daud.*)

Lighter or darker chestnut with numerous white transversal bands, (in some spotted with black,) on the sides forming a forked network, composed of brown scales edged with white; on each side of the hind-head a white triangular spot (confluent in some,) with brown spots; lips similarly coloured; beneath pearl-coloured; eyes black; tongue whitish.

Scuta 208 to 257; scutella 57 to 91.

Habit.—*Pinang.*
Bengal, Coromandel.

Var. A.

Syn.—Lycodon hebe, Var, Schlegel.

With a number of large square white spots, with black edges and central spots.

Habit.—*Pinang.*
Bengal.

Var. B.

Syn.—Russell II, Pl. 37.
Lycodon capucinus, Boie.
Lycodon hebe, Var. javan. Schlegel.
Lycodon atropurpureus, Cantor.

* Russell I, Pl. 26, Karetta, upon which is founded *Coluber galathea*, Daudin, appears to represent the present species, or one of its Varieties.

Chesnut or deep purple marbled with white veins, edged with black, with or without a white collar.

HABIT.—*Pinang, Malayan Peninsula.*

Tenasserim Provinces, Java.

VAR. C.

LYN.—Lycodon hebe, Var. timorensis, Schlegel.

Chestnut, with a white collar, and indistinct traces of white network.

HABIT.—*Pinang, Malayan Peninsula.*

Pulo Samao, Timor.

VAR. D.

SYN.—Russel II, Pl. 39.
Lydocon subfuscus, Cantor.

Uniformly light brown above, the lips white, edged with brown.

HABIT.—*Malayan Peninsula.*

Bengal.

This species occurs in the Malayan countries both in the hills and valleys, but it is apparently not so numerous as it is in Bengal. It is of fierce habits and defends itself vigorously, In one examined the stomach contained a young *Euprepis rufescens*, (Shaw).

The largest individual observed, *Var. B.*, was of the following dimensions:

| | | | |
|---|---|---|---|
| Length of the head,..... | 0 ft. | $0\frac{6}{8}$ | inch. |
| Ditto ditto trunk,..... | 1 | $8\frac{7}{8}$ | |
| Ditto ditto tail,..... | 0 | $4\frac{1}{8}$ | |
| | 2 ft. | $1\frac{6}{8}$ | inch. |

Circumference of the neck 1 inch, of the trunk $1\frac{4}{8}$, of the root of the tail $\frac{7}{8}$ inch

*Ophites.*—Wagler differing from *Lycodon* in the absence of the præ-orbital shield; frenal elongated; eyes small, scales rhombic with truncated points; some of the posterior dorsal scales keeled.

LYCODON PLATURINUS, (SHAW,)

SYN.—Seba Thes. I, 83, 3.
Russel, II, Pl. 41.
Coluber platurinus, Shaw.
Coluber platyrhinus, Merrem.
Lycodon subcinctus, H. Boie.
Ophites, Wagler.
Lycodon subcinctus, apud Schlegel.

Shining blackish brown with steel blue reflections, and a varying number of broad, distant bands, the lips, throat and a collar all white, spotted with black; beneath pale blackish brown, the anterior part of the abdomen, the sharp lateral angle and the broad posterior margins of the scuta and scutella whitish. Eyes black; tongue flesh-coloured.

Scutta 221, Scutella 74.

Habit,—*Pinang.*

Java, Bengal.*

On both sides of each jaw the anterior 4 or 5 teeth increase in size and are longer than the rest. The fifth upper maxillary tooth is removed from the preceding, which in addition to the general shape of the head and the lax integuments, imparts to this serpent a striking resemblance to the venomous genus *Bungarus*. In fierceness it resembles the preceding species. The only individual observed was captured near the summit of the Great Hill of Pinang, where it had seized a large *Euprepis rufescens*, (Shaw). It was of the following dimensions.

| | | | |
|---|---|---|---|
| Length of the head, ..... | 0 ft. | 1 | inch. |
| Ditto ditto trunk, ..... | 2 | $8\frac{4}{8}$ | |
| Ditto ditto tail, ..... | 0 | $7\frac{4}{8}$ | |
| | 3ft. | 5 | inch. |

Circumference of the neck $1\frac{5}{8}$, of the trunk $2\frac{4}{8}$ inch.

### Lycodon effrænis, n. s.

Shining bluish black above, with a few minute white spots, not affecting the ground colour; the throat, lips, and a band, bordering the sides of the head from the muzzle to the hind head, buff coloured, finely marbled with black; beneath strongly iridescent, pale bluish black, the scuta with whitish edges; the body encircled by a number (11,) of broad distant buff rings, above with indentated margins. Eyes black, pupil elliptical; tongue whitish.

Scuta 228; Scutella 72.

* According to M. Schlegel, who observes that a specimen has been forwarded from Bengal by M. Duvaucel. No specimen exists in the Museum of the Asiatic Society, nor are the natives acquainted with the species.

Habit.—*Pinang.*

The head is elongated, ovate depressed, broader than the neck, the muzzle rounded, slightly projecting; the anterior frontals are orbicular pentagonal, much smaller than the frontals, which are bent over the sides, substituting the absent frenal, so as to meet the second upper labial; the nasal is small, rectangular, obliquely wedged in between the rostral, the two pairs of frontals, and the anterior upper labial; the nostril large, piercing the middle of the shield; the vertical is elongated pentagonal, broader in front, so as to render the posterior part of the moderate supræorbitals broader than the anterior; the occipitals are the largest, elongated, on each side surrounded by 3 scales, somewhat longer than the rest covering the temples, and behind by two small post-occipitals. The eyes are proportionally large and prominent, surrounded by one præorbital and two smaller post-orbitals, the lower of which touches the narrow projecting fifth upper labial, which with the fourth, borders the lower part of the orbit; the jaws are covered by 8 pairs of upper, 9 of lower labials. The gape is moderate; the particulars of the dentition noted in *L. platurinus*, exist in the present species. The two anterior of the three pairs of small elongated mental shields are bordered by the six anterior pairs of labials; behind by a number of small scales. The trunk is slender, decreasing towards both extremities, with 17 longitudinal series of smooth, rhomboidal, slightly imbricate scales. The back is depressed, forming an angle with the compressed somewhat bulging sides. The latter are joined to the flat narrow abdomen under a right angle on the sides of the scuta, so that the vertical section of the body is quadangular. A single individual found by Sir Wm. Norris on the Great Hill of Pinang, was of the following dimensions:

| | |
|---|---|
| Length of the head, ..... | $0\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | $9\frac{6}{8}$ |
| Ditto ditto tail, ..... | $2\frac{2}{8}$ |
| | 1 ft. $0\frac{4}{8}$ inch. |

Circumference of the neck $\frac{4}{8}$, of the trunk $\frac{6}{8}$, of the root of the tail $\frac{2}{8}$ inch.

In fierceness the present species resembles its congeners, but unlike them, it raises vertically the anterior part of the body, and bites after

a few oscillating movements from side to side. *Lycodon platurinus*, and *aulicus*, like many other harmless,—and some venomous serpents, the pupils of which are vertically closed by the light, prepare to attack horizontally coiled on the ground, with the head bent close to the body, and drawn as far backwards as possible, when, suddenly uncoiling the anterior part of the body, they dart obliquely upwards, but as they are blinded, not always in the direction apparently aimed at, and they frequently miss the aim.

GEN. COLUBER, *Linné*

Abdomen with scuta; scutella under the tail.

COLUBER FASCIOLATUS, Shaw.

SYN.—Russel I. Pl. 21 Nooni Paragoodoo.
Coluber hebe, Daudin *(Synon.* apud Boie, Wagler, Schlegel).

"Cinereous grey with an obscure cast of reddish brown, particularly about the head and neck. The back variegated by black and white, or black and yellowish, narrow bands; and on the sides are two or three rows of short, separate oblique lines, formed by the yellow or white edges of the lateral scales; but in general these bands are not visible on the tail. The scuta (192) and scutella (62) are of a dusky pearl-colour." *(Russell I. Pg.* 26.*)*

HABIT.—*Malayan Peninsula.*
Coromandel Coast.

A young individual, killed in Province Wellesley corresponds to the description of Russell, copied by Shaw and Daudin. It has two small post-orbitals, one elongated præ-orbital, one minute irregularly hexagonal frenal, and on each side 8 upper, 9 lower labial shields. The trunk is covered by 21 longitudinal series of smooth imbricate scales, which are rhombic on the sides, rhomboidal above, all with rounded points. The teeth are of uniform size, and as Russell correctly describes them, very small, reflex, sharp, numerous. The dentition, therefore, sufficiently indicates that the species cannot be placed in the Gen. *Lycodon*, to which it has been referred by M. M. H. Boie, Wagler and Schlegel. The young one is of the following dimensions:

| | |
|---|---|
| Length of the head, ..... | $0\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | $8\frac{1}{8}$ |
| Ditto ditto tail, ..... | $2\frac{1}{8}$ |
| | $10\frac{6}{8}$ inch. |

Greatest circumference of the trunk, $\frac{5}{8}$ inch.

Scuta 201 ; Scutella 73.

COLUBER RADIATUS, Schlegel.

SYN.—Russell II. Pl. 42.
Coluber quadrifasciatus, Cantor, (Var.)

Head and back light yellowish bay, paler on the sides ; the hind head with a transversal black line, branching off along the exterior margins of the occipitals ; a black oblique streak behind the eyes, and another beneath them dividing both jaws. On each side of the back a broad longitudinal black band, relieved at intervals by a short network, produced by 3 or 4 scales of each series being edged with pale brown, and the skin between them white. The bands, in some commencing at a distance from the head, are continued or interrupted, terminating on the posterior part of the back. Below them is on each side a parallel black line ; lips, throat and lower surface yellow. Iris bright gamboge with a concentric black ring. Tongue bluish black.

*Young.* Above of clearer colours ; beneath pearl-coloured.

Scuta 222 to 248 ; Scutella 82 to 94.

HABIT.—*Pinang, Singapore, Malayan Peninsula.*
Java, Sumatra, Cochin China, Tenasserim, Assam.

This species is numerous in marshes, and paddy-fields, and often becomes a tenant of out-houses, where during the day it remains concealed, till nightfall favours its pursuit after rats. It is however equally diurnal, preying upon smaller birds, lizards and frogs. Assam produces a local variety distinguished by 18 instead of 17 longitudinal series of scales, of which the 3 upper ones are all lineated, whereas normally such is the case on those of the posterior part of the body. It makes a vigorous defence, and in darting at an enemy is capable of raising nearly the anterior two thirds of the body from the ground. In a female were found 23 whitish, soft, cylindrical eggs, of which the largest measured $1\frac{1}{8}$ inch. in length. The largest individual observed was of the following dimensions :

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | 4 | $3\frac{4}{8}$ |
| Ditto ditto tail, ..... ..... | 0 | $10\frac{4}{8}$ |
| | 5 ft. | $3\frac{4}{8}$ inch. |

Greatest circumference, $3\frac{6}{8}$ inch.

Habits and general appearance link the present species to *Col. dhumnades*, Cantor,* and *Col. mucosus*, Linné (*Col. blumenbachii*, Merrem,) but the latter as well as its variety with uniformly smooth scales (*Col dhumna*, Cantor: Spicil.) utter when irritated a peculiar *diminuendo* sound, not unlike that produced by a gently struck tuning-fork.

### Coluber korros, Reinwardt.

Syn.—Coluber korros, Reinwardt, apud Wagler, Schlegel.

Brownish green above, the scales of the posterior part of the trunk and of the tail with black points and edges, producing a regular network; beneath yellowish white or pearl-coloured; the lateral part of the scuta light bluish-grey. Iris bright yellow with a bluish grey or blackish concentric ring, tongue black.

*Young.*—Above with some indistinct transversal bands, produced by two lateral white spots on some of the scales; the posterior part of the trunk with dark longitudinal lines.

Scuta 162 to 190; Scutella 79 to 136.

Habit.—*Pinang, Singapore, Malayan Peninsula.*
Java, Sumatra, Arracan, Tenasserim.

It is numerous in the Malayan vallies. The largest individual measured:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{2}{8}$ inch. |
| Ditto ditto trunk, ..... | 2 | $6\frac{2}{8}$ |
| Ditto ditto tail, ..... | 1 | $4\frac{2}{8}$ |
| | 3 ft. | $11\frac{6}{8}$ inch. |

Greatest circumference of the trunk 3 inches.

Its habits are similar to those of the last mentioned species, from which it is easily distinguished by its 15 longitudinal series of smooth rhomboidal scales with rounded points.

### Coluber hexahonotus, N. S.

Head and back dark brown, changing to pale brownish buff on the sides; trunk with numerous, close, transversal black bands, each with

* *Chusan.*—It is covered by 14 to 16 long it. series of rhomboidal scales, of which those of the two uppermost series commence at a short distance from the head, exhibiting the central raised line.

a few white spots on the lower parts, becoming indistinct towards the posterior extremity of the trunk, from whence the colour is uniformly dark brown; labial shields yellow, edged with black; beneath yellowish white, scutella edged with brown. Iris gamboge with a black concentric ring; pupil round, tongue black; central series of dorsal scales hexagonal.

Scuta 191; Scutella 148.

Habit.—*Pinang.*

The head is distinct, elongated, with the muzzle broad, truncated, covered above with the normal number of shields, in form resembling those of *Col. korros*. The eyes are large, prominent, with two præorbitals, of which the superior is the larger, the inferior is wedged in between the 3rd, 4th and 5th upper labials. In addition to two postorbitals, there is an elongated crescent-shaped infra-orbital, resting on the 6th and 7th upper labials. The latter are 8 on each side, of which the 5th, broad hexagonal, borders the orbit; the following are elongated, gradually increasing in size. The lower labials, 9 on each side, lie on the chin in contact with two pairs of elongated shields. The nostrils are rather large, orbicular, opening near the margin of the anterior frontals. The frenal is small, obliquely situated between the surrounding shields. The temples are covered by two pairs of elongated shields. The gape is wide, the teeth minute, of equal length. The trunk is slender, much compressed with 17 longitudinal series of smooth, rhombic, sub-imbricate scales, of which the central series is hexagonal. The abdomen narrow, arched. The tail is very slender elongated, tapering to a sharp point.

A solitary individual, discovered by Sir William Norris on the Great Hill of Pinang, was of the following dimensions:

| | |
|---|---|
| Length of the head, . . . . . | $0\frac{5}{8}$ inch. |
| Ditto ditto trunk, . . . . . | 10 |
| Ditto ditto tail, . . . . . | $4\frac{5}{8}$ |
| | 1 ft. $3\frac{2}{8}$ inch. |

Circumference of the neck $\frac{5}{8}$, of the trunk 1 inch., of the root of the tail $\frac{3}{8}$. In fierceness it resembled the preceding species.

## ARBORIAL.

### Gen. Dipsas, *Laurenti.*

Head large, broad, depressed, cordate, covered with shields; neck narrow, trunk much narrower than the head, compressed, very long, beneath covered with scuta; tail cylindrical, imbricate.

### Dipsas dendrophila, Reinwardt.

Syn.—Scheuchzer, 662, Fig. 11. (Col. variabilis, apud Merrem.)
Dipsas dendrophila, apud Wagler.
Dipsas dendrophila, Wagler, apud Horsfield: *Life of Raffles.*
Dipsas dendrophila, apud Schlegel.

Head, back and sides intense black with steel-blue, lilac, and green reflections; beneath pale black, iridescent; body and tail with numerous bright yellow transversal bands, widened below, sometimes joined on the back or abdomen, occasionally reduced to irregular spots; throat and lips bright yellow, labials with black edges. Pupil elliptical, vertical; iris and tongue black.

Scuta 218 to 225, Scutella 100 to 112.

Habit.—*Pinang, Singapore, Malayan Peninsula.*
Java, Celebes.

It inhabits the Malayan hills and valleys, but apparently in no great numbers. The largest individual measured:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | 3 | $3\frac{7}{8}$ |
| Ditto ditto tail, ..... | 1 | 0 |
| | 4 ft. | $5\frac{3}{8}$ inch. |

Greatest circumference of the trunk, 4 inch.

### Dipsas multimaculata, Schlegel.

Syn.—Scheuchzer, 657, Fig. 2.
Russell, II. Pl. 23.
Dipsas multimaculata, Schlegel

Ground-colour, above light greenish grey, minutely spotted and marbled with brown; on the head an angular, backwards diverging black mark with whitish edges; a black oblique line from behind the eyes to the hind head, where it joins a lozenge-shaped black spot with whitish edges; along the back and tail a series of large, irregularly oval, black spots with whitish edges, arranged in close quincunx series;

the sides with numerous, similarly coloured, oblique or arched, often interrupted, bands; labials greenish white, black-edged; beneath greenish white, tinged with rose-colour, minutely spotted with brown, and with a double or treble lateral series of irregular black spots. Iris pale greenish golden, minutely dotted with black; pupil elliptical, vertical; tongue whitish.

Scuta 202 to 235, Scutella 80 to 106.

Habit.—*Pinang, Malayan Peninsula.*

Celebes, Java, Tenasserim, Bengal.

On the hills of Pinang this species appears to be more numerous than the former. The largest individual measured:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $0\frac{5}{8}$ inch. |
| Ditto ditto trunk, ..... | 1 | $10\frac{4}{8}$ |
| Ditto ditto tail, ..... | 0 | $5\frac{6}{8}$ |
| | 2 ft. | $4\frac{7}{8}$ inch. |

Greatest circumference, $1\frac{2}{8}$ inch.

The central hexagonal scales are elongated, narrow on the anterior part of the trunk, which is covered by 19 longitudinal series of smooth, lanceolate, imbricate scales; from thence commence 17 series of broader scales.

### Dipsas cynodon, Cuvier.

Syn.—Dipsas cynodon, apud Boie, Guerin, Schlegel.

*Young.* Ground-colour yellowish brown, head with a dark black-edged arrow-shaped mark, and a black oblique streak from the eye to the nape of the neck; labials pearl-coloured, edged with black; back with numerous black transversal marks, shaped like two letters I placed horizontally towards each other or in quincunx, becoming indistinct towards the tail. Beneath pearl-coloured with a black spot near the lateral part of the scuta; scutella edged and minutely dotted with brown.

Scuta 225, Scutella 92.

*Adult.* Head and back uniformly greyish brown tinged with lilac, with a number of distant large, transversal, purple, bands (the scales edged with black), lozenge-shaped with triangular lateral appendages, becoming indistinct towards the tail, which is alternately brownish buff

and purple with black-edged scales. Beneath pale yellow, scutella minutely dotted and edged with brown. Iris pale golden, minutely dotted with purple; pupil elliptical vertical; tongue whitish.

Scuta 275, Scutella 158.

Habit.—*Pinang, Malayan Peninsula.*

Java, Tenasserim.

A young one was captured on the Great Hill of Pinang by W. T. Lewis, Esq. An adult, killed in Province Wellesley, was of the following dimensions.

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | 4 | $0\frac{3}{8}$ |
| Ditto ditto tail, ..... | 1 | 4 |
| | 5 ft. | $5\frac{7}{8}$ inch. |

Circumference of the neck, $1\frac{6}{8}$, of the trunk, $2\frac{4}{8}$ inch.

The young had 21, the adult 23 longitudinal series of smooth, lanceolate, imbricate scales. The long maxillary and palatal teeth are disproportionally less developed in the young than in the adult.

Dipsas boa, (H. Boie.) (See Plate, Fig 3.)

Syn.—Amblycephalus boa, H. Boie: Isis.
Dipsas boa, apud Schlegel.

Ground colour above: rose-coloured washed with brown, varying in intensity and shade from light bay to umber, prevailing so as to make the ground colour appear as minute spots, and with numerous irregular black spots, confluent on the head; cheeks and lips carnation, with a vertical black streak from the middle of the orbit. Beneath carnation, dotted with umber, sometimes assuming the shape of large irregular spots. Iris: silvery rose-coloured, lower half dotted with black, pupil elliptical, vertically contracted by the light; tongue whitish.

Scuta abdominalia 164, Scuta subcaudalia 112; or 170+109.

Habit.—*Pinang.*

Java.

The head is depressed, elongated, conical, with the muzzle truncated; the rostral shield is very large, vertically placed; the cheeks compressed, but the lips very tumid below the eyes. Of the nine crown shields the occipitals are distinguished by their reduced size, and

frequent sub-division in 2 linear inter-occipitals, bordered by two large polygonal post-occipitals, enclosing a smaller third, linear. Behind the latter appears on each side a small hard tubercle, covered like the rest of the hind head with minute polygonal scales. Each temple is protected by 5 to 6 large shields, and as many smaller resting upon the labials. The nasal is large, pyramidal with the rounded nostril in the centre, and the apex wedged in between the 3 frenals, placed obliquely or vertically one above the other. The eye is large, prominent, encircled by the supra-orbital and 7 smaller shields, so that none of the upper labials reach the orbit. The lips are arched, and outwardly appear to reach to the hind head, but the commissure, or the angle of the mouth is situated immediately below the eye, which greatly reduces the opening of the mouth. Of the 9 pairs of upper labials the anterior 6 are narrow, but very deep and bulging; the posterior 3 are broader, elongated; the inferior labials, 11 pairs, are as well as the rostral, greatly reduced by the 3 pairs of very large mentals. The front view of the head grotesquely resembles that of a mastiff. All the teeth are strong, but the front tooth on each side of the lower jaw is longer than the rest; the palatal rows are very close together, and converging. The trunk is much compressed, covered by 13 longitudinal series of scales, of which the dorsal row is composed of very large hexagonal ones, each with a strong keel; the rest are smooth, rhombic, imbricate. The abdomen is very narrow, and the sides of the scuta are bent upwards. The tail is elongated, slender, tapering, and much less compressed than the trunk. Of two individuals from the hills of Pinang, the larger, a male, was of the following dimensions:

| | | |
|---|---|---|
| Length of the head,..... | 0 ft. | 1 inch. |
| Ditto ditto trunk,..... | 1 | 11 |
| Ditto ditto tail,..... | 0 | $11\frac{1}{8}$ |
| | 2 ft. | $11\frac{1}{8}$ inch. |

Circumference of the neck 1 inch, of the trunk $1\frac{5}{8}$, of the root of the tail $\frac{7}{8}$ inch. In a female were observed 4 cylindrical, whitish eggs, each $\frac{6}{8}$ inch in length. The stomach contained a few remains of insects.

This species is closely allied to *Dipsas carinata*, Schlegel, (*Amblycephalus*, Kuhl; *Pareas*, Wagler,) in which also the dorsal series of

scales are keeled. M. Schlegel's short description and figure (Pl. XI, 29, 30) appear to have been taken from an immature specimen.

---

The preceding four species are very fierce, their mode of attack is that of *Lycodon aulicus*. Kuhl has observed vibrating movements in the tail of *Dipsas multimaculata*, which however are also exhibited by *Dipsas trigonata* (Schneider), (*Col. catenularies*, Daudin,)—*D. cynodon*, Cuvier, and among the venomous serpents, by *Vipera russelli*, (Shaw) and several Asiatic species of *Trigonocephalus*, when they are irritated and preparing to bite.

---

Gen. Herpetodryas, *H. Boie.*

Head trigonal, very long, depressed, smooth, rather sharp; trunk and tail very elongated; scales, particularly those of the tail, large; those of the back partially carinate; in other respects resembling *Coluber*.

Herpetodryas oxycephalus, (Reinwardt.)

Syn.—Coluber oxycephalus, Reinwardt.
Gonyosoma viride, Wagler.
Herpetodryas oxycephalus, apud Schlegel.

Head above shining dark-green with a blackish straight line from the nostrils to the angle of the mouth; lips and throat pale yellowish green; trunk sea-green changing to light yellowish green on the lower part of the sides, all the scales with black edges; the anterior half of the tail, separated from the trunk by a transversal orange band, ochre, gradually changing to greyish brown on the posterior half, all the scales edged with black. Abdominal scuta light yellowish green with pale yellow edges; subcaudal scutella grey with black margins. Eyes moderate, little prominent; iris pale sea-green with a narrow pale yellow inner ring and a transversal black band; pupil circular, black. Tongue ultramarine, divided in the middle by a black longitudinal line. The exposed part of the larynx black.

Scuta 268, Scutella 149.

Habit.—*Pinang.*

Java, Celebes.

The shields of the head are elongated, most so the linear frenal. The teeth are numerous; in each row the anterior six or eight are

longer than the rest, which gradually decrease. The scales of the trunk, in 25 longitudinal series, are rhombic with rounded points, imbricate, and all smooth except those covering the spinous processes, which are faintly lineated.

Of two individuals from the hills of Pinang, the larger, taken by Sir William Norris, was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | 3 | 4 |
| Ditto ditto tail, ..... | 1 | 1 |
| | 4 ft. | $6\frac{4}{8}$ inch. |

Circumference of the neck 2, of the trunk 3, of the root of the tail $1\frac{4}{8}$ inch. The ferocious habits of this serpent have been accurately described by M. Reinwardt. It has in a remarkable degree the power of laterally compressing the neck and the anterior part of the body, when the greyish blue skin becomes visible between the separated scales. In such state of excitement it raises nearly the anterior third vertically from the ground, continues fixed during several seconds with vibrating tongue, and bites. It then throws itself down, to rise to a renewed attack. A similar mode of attack characterises the following species, viz: *Dryinus nasutus*, (Lacépède,) (Russell, I. Pl. 12 and 13,),—*D. prasinus*, (Reinwardt.) (*Dryiophis prasina* apud Schlegel,) *Leptophis pictus* (Gmelin), and *Leptophis caudalineatus*.

### Gen. Dryinus,* *Merrem*, 1820.

Upper jaw much longer than the lower; muzzle attenuated, more or less acute at the apex, which in some species is mucronate and moveable.

### Dryinus prasinus, (Reinwardt.)

Syn.—Seba, II, Tab. LIII, Fig. 4.
Coluber nasutus,† Shaw, apud Russell, II, Pl. 24.
Dryinus nasutus, Bell, (not Merrem, 1820.)

* In H. Boie's Genera, published in *Isis*, 1827, *Dryophis*, (Dahlman,) is substituted for this genus. Wagler in 1830 separated some species under the denomination of *Tragops*, and M. Schlegel in his "*Essay*" has exclusively retained *Dryiophis*, although Prof. Thos. Bell already in 1825 had published his article on *Leptophina* (comprising *Dryinus*, Merrem, and *Leptophis*, Bell.)

† The specific name was previously applied by Lacépède in 1790 to the other Asiatic species.

Dryophis prasinus, Reinwardt.
Tragops, Wagler.
Dryinus nasutus, Bell, apud Horsfield: *Life of Raffles.*
Passerita, Gray.
Dryiphis prasina, apud Schlegel.
"Ular daun" of the Malays.

Leek-green above, with some irregular white and black oblique lines, paler on the cheeks and upper lips; tail cinnamon; under lips and throat white, scuta and scutella light green or mother-of-pearl, on each side with a white or pale yellow longitudinal line, below which in some a second, green, line. Pupil black, elongated-pyriform, with the apex turned forwards, horizontally contracted by the light. Iris pale burnished golden, bright on the pupillary margin, the upper half of which forms a little behind its middle a small pointed lobe. Tongue bluish white.

Scuta 186 to 228, Scutella 140 to 203.

Habit.—*Malayan Peninsula and Islands.*

Celebes, Java, Cochin-China, Siam, Burmah, Tenasserim, Arracan, Bengal, Assam.

Var. A.

Syn.—Dryiophis xanthozonius, Kuhl?

Head less elongated and the rostral shield unusually small; upper lips in some white; besides the yellow and green lateral line, a central green; scuta and scutella in some with brown edges.

Habit.—*Same localities.*

Var. B.

Head above light brownish grey, tinged with sky-blue and rose-colour cheeks and lips pale rose; trunk light brownish ash, changing to pale rust colour on the tail; whitish grey on the sides; beneath buff, with a white longitudinal line on each side. Iris burnished silver, tongue white.

Habit.—*Pinang Hills.*

Var. C.

Upper parts saffron yellow, paler on the sides; beneath sulphur-coloured, with a lateral white line. Pupil deep burnished golden; tongue white.

Habit.—*Pinang Hills.*

This species is exceedingly numerous in the Malayan forests, both

in the hills and valleys, preying upon small birds, arborial lizards, frogs, and in early age upon insects. It may readily be distinguished from *Dryinus nasutus*, (Lacép.) (Merrem, not Bell;—Russell, I. Pl. 12, 13) by two, sometimes 3 frenals on each side. The trunk is covered by 15 longitudinal series of smooth rhomboidal scales with rounded points, imbricate so as to appear linear; those of the tail are all broad rhombic. The anterior upper maxillary teeth gradually increase towards the sixth, which is the longest, and enclosed in a pointed fold of gingiva. The following teeth, commencing at a short interval, are short, but the last is very long with a furrow on the convex edge. The inferior maxillary teeth also increase in length towards the sixth, the longest, and are protected by a broad triangular scabbard, containing several additional loose teeth; the rest are uniformly small, commencing at a short interval from the sixth. The palatal are uniformly very short. The largest individual of a great number measured:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | 2 inch. |
| Ditto ditto trunk, ..... | 4 | $3\frac{5}{8}$ |
| Ditto ditto tail, ..... | 2 | $6\frac{4}{8}$ |
| | 7 ft. | $0\frac{1}{8}$ inch. |

Circumference of the neck $1\frac{1}{8}$, of the trunk $2\frac{2}{8}$, of the root of the tail 1 inch.

The Varieties, of which *B.* and *C.* were from the hills of Pinang, are not numerous, and of a comparatively small size. The very young ones are as gentle as those of a more advanced age are ferocious. Their power of expanding the anterior part of the body and their mode of attack, have been noted under *Herpetodryas oxycephalus*.

### Gen. Leptophis, *Bell*, 1825.

Rostrum obtuse, and the upper jaw projects but very slightly beyond the lower.

### Leptophis pictus, (Gmelin.)

Syn.—Coluber pictus, Gmelin.
Coluber decorus, Shaw.
Russell, II. Pl. 26, Cumberi muken.
Bungarus filum, Oppel.
Dipsas schokari, Kuhl, (not Forskal.)
Dendrophis chairecacos, H. Boie.
Dendrophis, Wagler.
Dendrophis picta, Schlegel.

Head and body above bronze with strong golden reflections; skin between the scales of the anterior part of the body alternately ultramarine and black. Lips, throat, the two lowest lateral rows of scales, and the abdominal surface silvery mother-of-pearl. From the muzzle to the root of the tail a black line, bordering above the silvery sides, which below are circumscribed by a second black line, commencing a little behind the head. Iris bright golden with a transversal black line; pupil black, circular; tongue scarlet.

Scuta 167 to 187, Scutella 109 to 149.

Habit.—*Malayan Peninsula and Islands.*

Manilla, New Ireland, Waigiou, Amboina, New Guinea, Pulo Samao, Java, Sumatra, Cochin-China, Tenasserim, Burmah, Bengal, Assam, Coromandel.

Var. A.*

Syn.—Coluber filiformis, Linné, (young.)
Fil, Double Raie, Lacépède, (young.)
Russell, II. Pl. 25, Mancas, Rooka, Maniar.
Coluber bilineatus, Shaw.
Leptophis mancas, Bell.
Dendrophis maniar, Boie.
Ahœtula bellii, Gray. Ill. Ind. Zool.
Dendrophis lateralis, Gray: Ill. Ind. Zool.
Chrysopelea boii, Smith.
Dendrophis picta, Var. Schlegel.
Dendrophis boii, apud Cantor.

Above dull brownish black, with a light brown dorsal line; the two lowest series of scales pale greenish white, forming a lateral band, bordered above by a black line, commencing from the muzzle, more or less distinct, in some irregularly broken up on the anterior part of the body. A second faint black line below. Iris golden, in some dotted with black; tongue black.

Habit.—*Malayan Peninsula.*

Bengal, Assam, Ceylon.

The species occurs numerously in the Malayan hills and valleys, but the contrary appears to be the case with the plain Variety, which in Bengal is equally common. The following must be added to the description of M. Schlegel. The frenal shield is small, rectangular;

* The Variety, *Col. polychrous*, Reinwardt, appears to inhabit neither the Malayan Peninsula nor Bengal.

superior labials 9, inferior 10 or 11; one præ-orbital, two, in some three small post-orbitals. The trunk is covered by 15 longitudinal series of smooth, imbricate scales; the central dorsal series is wedge-shaped, in some almost hexagonal, the next six are linear, but the lowest, as well as all the scales of the tail, are broad rhombic with rounded points. In a female were found seven coriaceous, whitish eggs of an elongated cylindrical shape, each $1\frac{3}{8}$ inch in length. In habits and mode of attack this species resembles *Dryinus prasinus*, but it is not exclusively arborial. Probably no instance affords a more striking difference in colours, between species and variety than the present: the former with dazzling brilliant livery; the latter in its plain, dull colours. Both attain to similar size: the largest male examined was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{1}{8}$ inch. |
| Ditto ditto trunk, ..... | 2 | 6 |
| Ditto ditto tail, ..... | 1 | 1 |
| | 3 ft. | $8\frac{1}{8}$ inch. |

Circumference of the neck, $1\frac{2}{5}$, of the trunk, 2, of the root of the tail, 1 inch. This serpent appears to possess uncommonly acute hearing, and turns its head in the direction of the sound.

### Leptophis caudalineatus, N. S.

Syn.—Ahætula caudolineata, Gray: Illust, Ind. Zool.
Dendrophis ornata, Var, Schlegel.

Head, trunk, and tail above light brownish bronze, the scales with black edges, on the posterior half of the trunk four parallel black lines, terminating at the root of the tail, from whence commences a single central black line; sides metallic mother-of-pearl, from a short distance behind the head bordered by two parallel black lines of which the lower, the broader, covers the lower half of the last series of scales and the lateral part of the scuta; both the lines continue to the apex of the tail. Lips, throat and abdominal surface pale metallic citrine; the tail beneath with a black central line. Iris golden, dotted with brown; pupil round; tongue bluish white, the forked part black.

*Young.* Upper parts of the body Indian red, with metallic reflections.

Scuta 183 to 188, Scutella 105 to 110.

Habit.—*Pinang, Singapore.*

The head large, less depressed than in the preceding species, the muzzle broad, blunt; cheeks tumid; all the shields of the crown are short and broad, except the vertical which is laterally arched, and very narrow behind. There is a single elongated post-occipital, and the rest of the hind head is covered with broad hexagonal shields. Each temple is covered by two pairs of large shields, in front of which a pair of very minute ones, bordering upon the equally small post-orbitals. The eye is large, prominent; the præ-orbital and the linear frenal proportionally small; the nostrils large, opening in the middle of the nasal; the rostral broad, slightly arched beneath. The labials, 9 on each side of both jaws, resemble those of the preceding species. The mouth is large; the maxillary teeth strong, distant. In the lower jaw the anterior ones gradually increase in length till the fourth, which appears like a canine, the rest as well as the palatal teeth are all smaller, of uniform length. The chin is covered by the second pair of labials and two pairs of mentals, of which the posterior pair is elongated. The trunk is strong, less compressed than in the preceding species, with 13 series of smooth imbricate scales, of which the two lowest series are large rhombic with rounded points, the next four elongated rhomboidal (linear), and the odd central dorsal rhomboidal, not larger than the rest. The tail is covered with broad hexagonal, not imbricate, scales. The abdomen is narrow, flattened; the centre part of the scuta with strongly arched margins; the sides turned upwards and forming a continued sharp lateral ridge. The tail is slender, tapering; its vertical section nearly square.

Of this species but two individuals were observed: a young one at Singapore, an adult on the Great Hill of Pinang. The latter measured:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{2}{8}$ inch. |
| Ditto ditto trunk, ..... | 3 | $5\frac{6}{8}$ |
| Ditto ditto tail, ..... | 1 | 2 |
| | 4 ft. | 9 inch. |

Circumference of the neck, 2, of the trunk $3\frac{6}{8}$, of the root of the tail, $1\frac{1}{8}$ inch.

In its mixed arborial and terrestrial habits and in fierceness it re-

sembles *L. pictus*, but its power of compressing and expanding the forepart of the body is somewhat limited.

This species appears somewhat to approach to *Leptophis formosus*, (*Dendrophis formosa*, Schlegel,) but besides other distinguishing characters, it differs from that, and all other Asiatic species in having but 13 series of scales. The indifferent figure of *Ahætula caudolineata* in *Illustrations of Indian Zoology*, which appears to be all which has been published concerning this species, has led M. Schlegel to suppose it was intended to represent a Variety of *Leptophis pictus*, although the black outline of the head is correct.

LEPTOPHIS ORNATUS, (Shaw.)

SYN.—Scheuchzer, T. 606.
Seba, I. T. 94, Fig. 7.—II. T. 7, Fig. 1; T. 61, Fig. 2.
Russell, II. Pl. 2, Kalla Jin.
Coluber ornatus, Shaw.
Coluber ibiboboca, Daudin.
Coluber ornatus, Merrem, apud Horsfield: Life of Raffles.
Chrysopelea paradisi, H. Boie.
Dendrophis ornata, Schlegel.

HABIT.—Bengal, Ceylon.

VAR.

SYN.—Ular Chindi, Raffles.
Dendrophis chrysochloros, Reinwardt, (young.)

Head above intense velvety black, with three or four distant transversal bands, and numerous irregular spots of gamboge or sulphur colour; all the scales with an oval gamboge spot; from the hind head to the point of the tail a number of large rounded vermilion spots; lips, throat and abdominal surface greenish-gamboge, scuta and scutella with black margins. Iris and tongue black.

Scuta 198 to 236. Scutella 113 to 147.

*Young.* Head, trunk and tail above greenish olive, with a series of transversal black bands in pairs; the intervals between the bands vermilion; the sides with numerous distant, irregular, small black spots; lateral part of the scuta and scutella white, the ridge and the anterior margin black; the centre part pale greenish yellow; scutella partially edged with black, and with a central light blue line. Tongue vermilion, the forked part black.

HABIT.—*Pinang, Malayan Peninsula.*
Java, Sumatra, Tenasserim, Arracan.

The Variety, in which the black colour prevails, appears to be confined to the more southern countries, while that with yellow ground colour preponderating, the one described and figured by Russell, occurs in Bengal. The latter has the tongue alternately vermilion and black. Individuals without the frenal shield are not uncommon, and such was the one described by H. Boie as a distinct species (*Chrysopelea paradisi*.) It inhabits the Malayan hills and valleys, but is there apparently less numerous than in Bengal. The largest male observed was of the following dimensions :

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{1}{8}$ inch. |
| Ditto ditto trunk, ..... | 2 | $7\frac{6}{8}$ |
| Ditto ditto tail, ..... | 0 | $11\frac{4}{8}$ |
| | 3 ft. | $8\frac{3}{8}$ inch. |

Circumference of the neck, $1\frac{1}{8}$, of the trunk, $1\frac{7}{8}$, of the root of the tail, $\frac{7}{8}$ inch.

The trunk is covered by 17 longitudinal series of smooth, imbricate rhomboidal scales, with rounded points. It is but seldom seen in trees ; it is more frequently found on the ground in the grass, watching for its prey : lizards (*Geckonidæ*,*) and frogs. The female has 6 to 8 white, elongated cylindrical eggs, about $1\frac{2}{8}$ inch in length. It differs from the other species in its being deprived of the power of compressing, and expanding the anterior part of the body, and in its gentleness. The young ones never attempt to bite, the adult but seldom, and without raising vertically the anterior part of the body. In the latter the four anterior teeth of the lower jaw are a little longer than the rest, which are uniformly small.

## AQUATIC.

### Gen. Tropidonotus, *Kuhl.*

Head oblong ovate, rather indistinct, depressed ; nostrils between the sutures of two shields ; eyes moderate, with circular pupil, scales of the back lanceolate ovate, keeled, imbricate ; trunk elongated, cylindrical, tail moderately long, tapering.

* Vide *Ptychozoon homalocephalum*, supra.

TROPIDONOTUS UMBRATUS, (Daudin,) VAR.

SYN.—Tropidonotus trianguligerus, Schlegel.

Above shining brownish, or yellowish green olive; lips gamboge with a black oblique line between the sixth and seventh labials, a second from the orbit to the angle of the mouth; a third from the under lip to the upper part of the neck; trunk and tail with numerous black spots, in some very minute, irregular, in others larger, approaching to quincunx order; the sides with numbers of large square or triangular scarlet spots, separated from each other by broader or narrower black vertical bands. Scuta and Scutella gamboge with black margins, the latter with a black central line. Iris black with a narrow golden circle; tongue black.

Scuta 121 to 130, Scutella 76 to 84.

HABIT.—*Malayan Peninsula and Islands.*
Java, Bengal.

The vertical and supra-orbital shields are of an elongated narrow form; the anterior frontals triangular, longer than broad; the nostrils small, placed high on the sides, the frenal is elongated pentagonal, with the largest margin touching the præ-orbital. Of the three post-orbitals the lowest is the longest, wedged in between the fifth, sixth, and seventh upper labials, of which the fifth is the only one which reaches the orbit; the eye is moderate, prominent; the upper labials are 9, the lower 11 on each side. The mouth is very large, the teeth small, crowded, except the two last of the upper jaw, which are longer than the rest. The trunk is slightly compressed, covered by 19 longitudinal series of scales, of which the two lowest are broad rhombic, the rest elongated rhomboidal with rounded points, those of the back lineated. The abdomen is broad arched. This Variety differs in nothing but colours from *Tropidonotus umbratus*,* (Daudin), and to judge by the description of M. Schlegel, it appears to be identical with *T. trianguligerus*. In the Malayan valleys the Variety is very numerous; in Bengal it is less so, but there the species abounds in and near fresh water, where it preys upon fishes and frogs. The Variety attains to a

* Syn. Russell, II. Pl. 3. *Dooblee*, young.—Pl. 5. *Dora*, adult.—*Col. umbratus*, Daudin.—*Col. dora*, Daud.—*Col. brunneus*, Herrman.—*Col. atratus*, Herrm.—*Col. lugubris*, Merrem.—*Tropidonotus umbratus*, Schlegel.—*Tropidonotus dora*, apud Cantor.

size similar to that of the species, both of which are equally fierce. The largest individual was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, . . . . . | 0 ft. | $1\frac{3}{8}$ inch. |
| Ditto ditto trunk, . . . . . | 1 | $9\frac{5}{8}$ |
| Ditto ditto tail, . . . . . | 0 | $9\frac{3}{8}$ |
| | 2 ft. | $8\frac{3}{4}$ inch. |

Circumference of the neck, 2, of the trunk, $2\frac{5}{8}$, of the root of the tail, $1\frac{5}{8}$ inch.

### Tropidonotus stolatus, (Linné.)

Syn.—Seba, II, Tab. 9, Fig. 1, 2.
Coluber stolatus, Linné.
Le Chayque, Daubenton, Lacépède.
Russell, I, Pl. 10, 11, 19.
La vipère chayque, Latreille.
Coluber stolatus, Lin., apud Shaw, Daudin.
Coluber tæniolatus, Daudin.
Natrix stolatus, Merrem.
Tropidonotus stolatus, Gray, Schlegel.

Head shining brownish olive with several black spots in the sutures of the shields: lips gamboge with several black oblique streaks; head and trunk brownish olive with numerous distant black transversal bands, becoming indistinct towards the tail, and intersected by two parallel bands of a pale ochre or buff, the scales of which on the anterior part of the body edged with black. Beneath gamboge or mother-of-pearl; in some the scuta with a small lateral black spot, or edged with black. Iris black with a narrow golden ring; tongue black.

Scuta 143 to 156, Scutella 69 to 79.

Habit.—*Pinang, Malayan Peninsula.*

Philippines, Tenasserim, Bengal, Assam, Nipal, Coromandel, Ceylon, Bombay.

This species, so exceedingly numerous in Bengal, is but rarely seen in the Malayan valleys. It is of very gentle habits, and feeds upon young frogs and toads. The largest male observed was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, . . . . . | 0 ft. | $0\frac{7}{8}$ inch. |
| Ditto ditto trunk, . . . . . | 1 | $4\frac{2}{8}$ |
| Ditto ditto tail, . . . . . | 0 | $5\frac{1}{8}$ |
| | 1 ft. | $10\frac{2}{8}$ inch. |

Circumference of the neck, $\frac{7}{8}$, of the trunk, $1\frac{3}{8}$, of the root of the tail, $\frac{6}{8}$ inch.

The female has 6 small cylindrical white eggs, each about half an inch in length.

TROPIDONOTUS SCHISTOSUS, (Daudin.)

SYN.—Russell II. Pl. 4. Chittee.
Coluber schistosus, Daudin.
Tropidonotus schistosus, Schlegel.
Tropidonotus moestus, Cantor.

Above blackish olive, some with an indistinct blackish line from behind the eye along the side; the lips, the two lowest series of scales on each side, and the abdominal surface whitish yellow. Iris black with a narrow golden ring; tongue small, flesh coloured.

Scuta 138, Scutella 77.

VAR.

SYN.—Tropidonotus surgens, Cantor.
Above bright greenish olive, with a black serrated lateral line.
Scuta 148, Scutella 23.

HABIT.—*Malayan Peninsula.*

Philippines, Tenassarim, Bengal, Madagascar.

The shields of the head are short; there is but a single anterior frontal, of a triangular shape, truncated in front; the frontals are small pentagonal; the nasals nearly equal to the latter; the small semicircular nostrils almost vertical and appearing linear as they are provided with a valvule as in *Homalopsis;* from the lower part of the nostril a minute arched groove descends to the inferior margin of the shield; the frenal is small; the præ-orbital in length nearly equals the three postorbitals. The scales of the trunk are disposed in 17 longitudinal series, of which the two lowest on each side are hexagonal, each scale with a minute round protuberance near the apex; the scales of the next two series present a raised line terminating in a protuberance, but the remaining scales are elongated rhomboidal with truncated, slightly notched points, keeled, imbricate. These marks become indistinct when the integuments are about to be changed, which probably caused them to escape the notice of Russell. This species is not numerous in Bengal, and apparently less so on the Malayan Peninsula. The largest individual measured,

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | 1 inch. |
| Ditto ditto trunk, ..... | 2 | $0\frac{4}{8}$ |
| Ditto ditto tail, ..... | 0 | $2\frac{4}{8}$ |
| | 2 ft. | 4 inch. |

Circumference of the neck : $1\frac{6}{8}$, of the trunk : $2\frac{4}{8}$, of the tail $1\frac{3}{8}$ in.

The length of the tail is very variable : in some it is contained $3\frac{1}{2}$, in other 6 times in the entire length. This species is very fierce, and prepares to attack by raising the head 3 or 4 inches vertically from the ground, and it has the power of flattening and laterally expanding the skin of the anterior part of the body, like *Naja*, but in a much slighter degree. It bites uttering a faint hissing sound. Frogs and fishes form its food.

TROPIDONOTUS CERASOGASTER.

SYN.—Psammophis cerasogaster, Cantor.

Above yellowish brown with pale golden reflections ; lighter on the sides, the scales of which in some partially edged with yellow ; cheeks, lips, throat and abdominal surface cherry-coloured, with a bright yellow lateral line from the muzzle to the point of the tail. Iris and tongue cherry-coloured.

Scuta 144 to 149, Scutella 60 to 69.

HABIT.—*Malayan Peninsula.*

Bengal, Assam.

The head is elongated, depressed ; sides angular, compressed ; muzzle truncated ; rostral broad, hexagonal, nearly vertical, arched below ; the anterior frontals the smallest, next to them the frontals ; the rest of the crown-shields are narrow, elongated ; each occipital bordered by two pairs of elongated temporals, below which three smaller. Nasals rectangular, placed at a right angle with the anterior frontals ; nostrils moderate, lateral ; the frenal smaller than the nasal ; præ-orbital longer than either ; the eye moderate, prominent. Besides three post-orbitals, there is a minute infra-orbital wedged in between the fifth and sixth upper labials, of which but a small portion of the sixth touches the orbit below. The lips are straight, turned up near their commissure, covered with 8 or 9 pair of upper, 10 lower shields. The mouth is large ; the teeth small, crowded, of equal length The trunk is cylindrical, compressed, covered with 19 longitudinal series of imbricate, elon-

gated rhomboidal scales with rounded, slightly notched points, keeled except the two lowest series on each side, which are larger than the rest, rhombic, smooth. The abdomen is broad, arched; the tail robust at the root, cylindrical, tapering to a sharp point. A solitary individual from Province Wellesley was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $0\frac{7}{8}$ inch. |
| Ditto ditto trunk, ..... | 1 | $5\frac{7}{8}$ |
| Ditto ditto tail, ..... | 0 | $6\frac{1}{8}$ |
| | 2 ft. | $0\frac{7}{8}$ inch. |

Circumference of the neck, $\frac{7}{8}$, of the trunk, $1\frac{4}{8}$, of the root of the tail, $\frac{7}{8}$ inch.

In Bengal this species is not numerous. It is very fierce, attacks in a vertical attitude, but without expanding the anterior part of the body. Its food is that of the preceding. The elongated angular head makes this species resemble a *Psammophis*.

TROPIDONOTUS JUNCEUS, N. S.

Head above shining light brown, lips and throat gamboge; from the angle of the mouth an oblique gamboge band, both joining under a sharp angle on the neck; trunk and tail dull greyish olive, with a series of distant rounded whitish spots on each side; each scutum and scutellum with a small black spot on the sides, which as well as their anterior margins are minutely dotted with brown. Iris black with a golden ring; tongue small, greyish.

Scuta 157, Scutella 88.

HABIT.—*Pinang*.

The head is elongated ovate, with the sides angular, compressed; the muzzle truncated; the rostral shield moderate, square, deeply arched beneath, vertically fixed; the anterior frontals small, tetragonal; the frontals larger, angularly bent over the side, where they border the small square frenal; the other crown shields are rather small, the occipitals on each side bordered by small elongated shields, like the rest of the temples; the eyes large, prominent; præ-orbital one; post-orbitals three; nasal rectangular; nostrils lateral, large, rounded; upper labials 9, of which the fourth, fifth and sixth border the orbit; lower labials 11; mentals two pairs, elongated. The lips are slightly arched, the mouth wide; the teeth small, crowded; the last upper

maxillary tooth longer than the rest. The trunk is very slender, cylindrical, with the centre of the back raised, forming a sharp ridge, the sides bulging near the abdomen, which is arched. The scales are imbricate, very elongated rhomboidal with the apex notched, except the two lowest series on each side, which are broad rhombic; they are all sharply keeled, and disposed on the anterior part of the trunk in 19, on the middle part in 17 longitudinal series. The tail elongated, cylindrical, very slender, tapering to a fine point. A single individual observed on the Great Hill of Pinang by W. T. Lewis, Esq. was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, . . . . . | 0 ft. | $0\frac{6}{8}$ inch. |
| Ditto ditto trunk, . . . . . | 1 | 7 |
| Ditto ditto tail, . . . . . | 0 | $7\frac{3}{8}$ |
| | 2 ft. | $3\frac{1}{8}$ inch. |

Circumference of the neck, $\frac{7}{8}$, of the trunk, $1\frac{1}{8}$, of the root of the tail, $\frac{7}{8}$ inch.

Like most of the Asiatic species of this genus, the present is of fierce habits. It twice unprovokedly bit a wood cutter who happened to pass it. The bite, of course, was productive of no consequences except a slight momentary pain. The very slender make and the elongated tail are characters which approach this species to the arborial *Colubridæ*.

### Gen. Homalopsis, *apud Schlegel.*

(*Erpeton*, Lacépède, 1803.—*Rhinopirus*, Merrem, 1820.—*Pseuderyx*, Fitzinger, 1826.—*Homalopsis*, Kuhl, 1827.—*Cerberus*, Cuvier, 1829.—*Hypsirhina*, Wagler, 1830.—*Hydrops*, Wagler, 1830.—*Helicops*, Wagler, 1830.—*Potamophis*, Cantor, 1836.)

*Homalopsis*, Kuhl. Nostrils opening vertically in the centre of the small nasals, with a valvule; crown shields small; dorsal scales imbricate, keeled; chin with many small shields, throat scaly; labials narrow; abdomen with scuta; tail short, tapering to a sharp point; beneath with scutella.

### Homalopsis rhinchops, (Schneider)

Syn.—Seba, II. T. 15. F. 3.
Hydrus rhinchops, Schneider.
Russell, I. Pl. 17. Karoo Bokadam.
Russell, II. Pl. 40, (young.)
Boa moluroides, Schneider.

Elaps boæformis, Schneider.
Enhydrus rhynchops, Latreille.
Hydrus einereus, Shaw.
Hurria schneideriana, Daudin.
Coluber schneiderianus, Daudin.
Coluber cerberus, Daudin.
Python rhynchops, Merrem.
Python elapiformis, Merrem.
Python molurus, Merrem.
Coluber obtusatus, Reinwardt.
Cerberus (Homalopsis obtusatus), Cuvier.
Homalopsis schneiderii, Schlegel.
Cerberus einereus, Cantor.

*Young.* Ash-coloured above, the head with black irregular spots and a short black line behind the eyes; trunk and tail with numerous distant black transversal bands; lips and throat white, dotted with black; the three or four lowest series of lateral scales white; beneath white with a black undulating band, frequently interrupted.

*Adult.*—Ash, lead-coloured or blackish grey with the black marks indistinct or invisible. Iris black; pupil elliptical, vertically contracted by the light; tongue very small, pale greyish.

Scuta 143 to 156, Scutella 49 to 72.

Habit.—*Malayan Peninsula and Islands.*

New Guinea, Amboina, Timor, Sarapua, Java, Sumatra, Tenasserim, Bengal, Coromandel.

The shields of the upper part of the head, which appear to be of a constant form, are the nasals, the frontals, which enclose the small pair of triangular anterior frontals, (sometimes soldered together,) and the supra-orbitals. The rest are broken up in small, irregular, smooth pieces, differing in outline in each individual. The small eye, placed in a partly vertical, partly lateral position, is surrounded by a præ-orbital a post-orbital and two or three infra-orbitals. The frenal is comparatively, large, irregularly tetragonal. The anterior seven upper labials are narrow, very high; the posterior five or six each divided in two. A similar arrangement is observed in the inferior 13 or 14 of which the posterior 6 or 7 are very small. On the chin there is a pair of elongated shields immediately behind the 2 pair of labials. The posterior upper maxillary tooth is longer than the rest, and furrowed. The three anterior teeth in the lower jaw are longer than the rest. The trunk is covered with imbricate, finely lineated and keeled scales, of a rhom-

boidal form with rounded points, disposed on the anterior part in 25, on the posterior part in 17, longitudinal series. The tail is robust, tapering, and prehensile. In the Malayan countries this species occurs in numbers in rivers, estuaries, and occasionally along the sea coasts. It feeds upon fishes. Single individuals measuring between 3 and 4 feet in length, are of very rare occurrence. Of a great number the largest was of the following dimensions :

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{3}{8}$ inch. |
| Ditto ditto trunk, ..... .... | 2 | 3 |
| Ditto ditto tail, ..... | 0 | 7 |
| | 2 ft. | $11\frac{3}{8}$ inch. |

Circumference of the neck, $1\frac{1}{8}$, of the trunk, $3\frac{3}{8}$, of the root of the tail, $1\frac{6}{8}$ inch. It is of peaceful habits ; the female brings forth 8 living young, each of which measures from 7 to $7\frac{1}{2}$ inches in length.

HOMALOPSIS BUCCATA, (Linné.)

SYN.—Scheuchzer, Pl. 660, fig. 1, (young.)
Seba, II. Tab. 12. F. 1 ;—T. 13, F. 1 ;—T. 21, F. 3, (young.)
Coluber buccatus, Linné,
Coluber monilis, Linné.
Coluber subalbidus, Boddaert. apud Gmelin.
Le Demicollier. Lacépède.
Vipernkoptige Natter, Merrem.
Coluber buccatus, apud Shaw.
Russell, II, Pl. 33, (young.)
Coluber viperinus, Shaw.
Coluber buccatus, Daudin.
Coluber horridus, Daudin.
Echidna semifasciata, Merrem.
Homalopsis buccata, Schlegel.

*Young.* Ground colour, white or buff, becoming brownish on the crown shields, hindhead and lips ; on the muzzle an angular mark, with the apex between the frontals, Van Dyke brown or chestnut ; an oblique streak proceeds from the eye over the cheek, joining a broad cervical band, which, sending a narrow straight line to the occipitals, gives the upper part of the head a heart-shaped outline ; the back and tail with numerous broad transversal brown bands, between which the ground colour appears in the shape of white, often interrupted, narrower bands, and of a white spot in the centre and on each side of the brown bands. The latter reach but as far as the lowest four or five series of scales on the sides, which as well as the throat and abdomen are white ; on each

side of every third or fourth scutum a brown spot; scutella black, or white, closely spotted with black.

*Adult*. The livery of the young indistinct: the ground colour of the upper parts pale greyish brown or olive; the bands of a darker shade of the same colour, edged with black; sides and beneath impure buff, the brown marks pale. Pupil black, elliptical, vertically closed by the light; tongue small whitish.

Scuta 155 to 167, Scutella 73 to 89.

Habit.—*Pinang, Malayan Peninsula.*
Java.

From the small, nearly vertically opening nostrils, proceeds a furrow downwards to the lower margin of the nasal. The anterior frontal is either entire and of a large rhombic shape, or consisting of two triangular shields; the frenal is elongated, rectangular, the small eye is situated more laterally than in the preceding species, and surrounded by two post-orbitals, one præ-orbital, and two infra-orbitals. The seven anterior upper labials are very high, the posterior five are double; of sixteen or seventeen lower labials, the nine anterior are the highest. The last tooth in the upper jaw is furrowed, and as well as the 3 or 4 anterior palatal and inferior maxillary teeth, longer than the rest. The folds of gingiva enveloping the teeth are very ample, and contain in addition to the fixed, numerous, 5 to 6 deep, accessory teeth. The chin is covered by four pairs of elongated scales, decreasing in length from the centre towards the labials. The scales of the trunk are rhombic, imbricate, slightly keeled and finely lineated, disposed on the anterior part in 39, on the posterior in 25 longitudinal series. The tail is robust, tapering and somewhat prehensile. The largest individual observed was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{1}{8}$ inch. |
| Ditto ditto trunk, ..... | 1 | 11 |
| Ditto ditto tail, ..... | 0 | 7 |
| | 2 ft. | $7\frac{1}{8}$ inch. |

Circumference of the neck, 2, of the trunk, $3\frac{4}{8}$, of the root of the tail, $1\frac{6}{8}$ inch.

In the valleys of Pinang and on the opposite continent, this species is numerous in streamlets, tanks and in the irrigated fields,

where it feeds on fishes. The young ones are very gentle, and the old but seldom bite. In their movements they are sluggish, and on dry land very awkward. The female brings forth six or eight living young at the time, each between 7 and 8 inches in length.

---

*Hypsirhina*, Wagler. Resembling *Homalopsis* in the form and situation of the nostrils, the integuments and general appearance of the head, trunk, and tail; but the dorsal scales are smooth, and the labials are square, equal; (frenal, one.)

HOMALOPSIS SIEBOLDI, Schelgel.

SYN.—Seba, II, Tab. 46, Fig. 2?

*Young.* Ground colour, white, which on the upper part of the head appears in the shape of two lines diverging from the muzzle over the eyes to the sides of the head. From each side of the vertical shield a line diverging towards the hind head, where it branches in two, sending a portion transversely to the throat, and another to the upper part of the neck joining under an angle that of the opposite side. On the trunk and tail the ground colour shows itself as numerous narrow, transversal bands, which on the centre are frequently interrupted and placed in quincunx series; on the sides the bands are bipartite. The intervals between the ground colour are chestnut with dark brown edges. The lips and the abdominal surface white with numerous pale brown irregular spots. Iris greyish with a transversal black bar; pupil elliptical, tongue white.*

Scuta 155, Scutella 48.

HABIT.—*Malayan Peninsula.*

Bengal.

The description is taken from a solitary young individual, which was killed in Province Wellesley. It measured,

* *Adult.*—A preserved specimen in the Museum of the Asiatic Society differs from the young in having the head above of a uniform colour, while the rest of the peculiar design is retained. The ground colour is yellowish white; the brown of the young is faded to a dull lead grey.—Scuta 156, Scutella 55.—Dimensions: head $0\frac{7}{8}$ inch: trunk 1 ft. $8\frac{2}{8}$ inch; tail $3\frac{7}{8}$ inch = 2 ft. 1 inch.—Circumference of the neck, $1\frac{7}{8}$, of the trunk, $2\frac{5}{8}$, of the root of the tail, $1\frac{2}{8}$ inch. The locality from whence this specimen was obtained, is not known: Bengal is given by M. Schlegel.

| | |
|---|---|
| Length of the head, ..... | $0\frac{4}{8}$ inch. |
| Ditto ditto trunk, ..... | $5\frac{7}{8}$ |
| Ditto ditto tail, ..... | $1\frac{5}{8}$ |
| | 8 inches. |

Circumference of the neck, $\frac{5}{8}$, of the trunk, $\frac{7}{8}$, of the root of the tail, $\frac{4}{8}$ inch.

In livery and in general appearance this species resembles *H. buccata*, from which it differs in the following particulars. Both the upper and the lower rostral shield are very small; the anterior frontals are much broader than long, each like a small transversely placed cone, surrounded by the nasal, (with a slit towards the lower margin,) the tetragonal frenal, and behind, by the frontal. The vertical in extent nearly equals each of the short occipitals. The eye is rather large, prominent, surrounded by a single elongated, arched præ-orbital and two post-orbitals, of which the inferior is the larger, bordering the fifth and sixth upper labials. Of the latter there are eight on each side: the fourth borders the eye below, the two posterior are broken up in small pieces. Of the 11 or 12 pairs of lower labials, the 4 nearest the angle of the mouth are the smallest. The chin is covered by three pairs of oval shields, of which the anterior is the largest, and by some minute scales. The mouth is small; the teeth minute, uniform, except the last upper maxillary tooth, which is the longest with a furrow on the convex margin. The back is slightly angular in the centre, much depressed; the sides bulging; the abdomen narrow. The anterior part of the trunk is covered with 29, the posterior with 19 series of small smooth, imbricate scales, all rhombic with rounded points. The tail is tapering and compressed.

### Homalopsis enhydris, (Schneider.)

Syn.—Russell, I. Pl. 30. Mutta Pam, Ally Pam.
Hydrus enhydris, Schneider.
Enhydris cœrulea, Latreille.
Hydrus atrocœruleus, Shaw.
Coluber pythonissa, Daudin.
Homalopsis aer,* Boie.
Hypsirhina, Wagler.
Potamophis lushingtonii, Cantor.
Homalopsis aer, Schlegel.
Homalopsis olivaceus, Cantor.

* This specific name is singularly ill chosen, as the denomination "*ular ayer*," (water-serpent,) is applied by the Malays to all fresh water serpents. The word "*ayer*" applied to a single species is as eligible as would be "*aqua*," "*eau*" or "*wasser*."

Iridescent dark greenish-or brownish-olive above; the scales edged with black; in some two parallel light greyish lines from between the eyes to the tip of the tail; the lower half of the sides pale greenish or brownish-grey; lips and throat white, edged and dotted with black. Abdominal surface white or buff, with a greenish or brownish line on each side, and a black central line dividing the scuta and scutella. Iris greyish or pale olive; pupil circular; tongue whitish.

*Young:* with lighter and more strongly iridescent colours than the adult.

Scuta 148 to 167; Scutella 53 to 71.

Habit.—*Malayan Peninsula and Islands.*

Java, Tenasserim, Bengal, Coromandel.

The head is small, ovate, scarcely distinct; the nostrils are hemispherical, with a slit towards the external margin of the shield; the single anterior frontal is small, rhomboidal, much broader than long; the eye is rather large, prominent, lateral and surrounded by two rather broad post-orbitals, one or two narrow præ-orbitals, and beneath by the fourth upper labial; the frenal is small, rhombic. The external margins of the occipitals are bordered by three elongated shields, and each temple by five similar. The eight upper labials are larger than the ten lower. The chin is covered by two central pairs of elongated shields, between which and the labials is, on each side, a single very elongated shield. The mouth is small, the teeth minute, numerous and equal, except the last tooth of the upper jaw, which is longer than the rest and furrowed. The trunk is very robust, broadly depressed; the sides obliquely compressed, and the abdomen very narrow, flattened. The scales are broad rhomboidal with rounded points, slightly imbricate, and disposed on the anterior part in 25, in the middle in 21, and near the tail in 19 longitudinal series. The tail is very slender, somewhat compressed, tapering and prehensile. The largest individual was of the following dimensions:—

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | 1 inch. |
| Ditto ditto trunk, ..... | 1 | $5\frac{6}{8}$ |
| Ditto ditto tail, ..... | 0 | $5\frac{2}{8}$ |
| | 2 ft. | |

Circumference of the neck, $1\frac{2}{8}$, of the trunk, $2\frac{6}{8}$, of the root of the tail, $\frac{7}{8}$ inch.

Numbers of this species may be seen in rivers, as well as in irrigated fields and estuaries, preying upon fishes, which however it refuses in a state of captivity. It is of timid and peaceful habits. A large female, after having been confined upwards of six months in a glass vessel filled with water, brought forth eleven young ones in the manner noted above under *Acrochordus javanicus*. During the process she lay motionless on the bottom of the vessel, the anterior part of the abdomen was retracted towards the vertebral column, while the muscles of the posterior part were in activity. Shortly after the parturition she expired under a few spasmodic movements, and also two of the young ones died in the course of about two hours, after having, like the rest, shed the integuments. In length they varied from 6 inches to $6\frac{2}{8}$. The living nine presented a singular appearance: they remained a little way below the surface of the water coiling themselves round the body of an adult male, which was also kept in the vessel, occasionally lifting the heads above the surface to breathe, at the same time resisting the efforts of the senior to free himself. Fishes and aquatic insects were refused, in consequence of which the young ones expired from inanition in the course of less than two months.

### Homalopsis plumbea, Boie.

Syn.—Hypsirhina, Wagler.
Hypsirhina hardwickii, Gray: Illust. Ind. Zool.
Homalopsis plumbea, Schlegel.

Iridescent dark brownish-or greyish-olive above, uniformly or with small irregular black spots; the two or three lowest series of scales yellowish, each scale spotted or edged with brown; lips and throat yellow; scuta and scutella yellowish white, the former in some partially edged with black, the latter with a black central zig-zag line; iris grey; pupil elliptical, vertically contracted by the light; tongue whitish.

Scuta 125 to 126; Scutella 36 to 44.

Habit.—*Pinang*.
Java.

The head is broad, ovate, depressed; the muzzle blunt, the nostrils small triangular, with a slit towards the lower margin of the nasal; the single anterior frontal broad triangular; the rest of the crown shields are of normal form. The eye is small, placed in a half lateral half

vertical position, enclosed by two post-orbitals, one elongated præ-orbital, and beneath by the fourth upper labial; the frenal is very small, tetragonal; the upper labials eight, rather high; lower labials ten; on both jaws the shields increase in size towards the angle of the mouth. The chin is covered with two pairs of elongated shields and a few gulars. The mouth is small; the posterior upper maxillary tooth longer than the rest, furrowed, and the anterior lower maxillary teeth also exceed the following. In addition to the fixed teeth there are several accessory series. The trunk is nearly cylindrical, slightly depressed, covered with small rhombic scales, smooth, and not imbricate, disposed on the anterior part in 19, on the posterior part in 17 longitudinal series. The tail is short, conic, tapering and slightly prehensile. Two individuals, taken at different times in rivulets in the valley of Pinang, in habits resembled *H. rhinchops*. The larger was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $1\frac{1}{8}$ inch. |
| Ditto ditto trunk, ..... | 1 | 5 |
| Ditto ditto tail, ..... | 0 | $2\frac{6}{8}$ |
| | 1 ft. | $8\frac{7}{8}$ inch. |

Circumference of the neck, $1\frac{5}{8}$, of the trunk, $2\frac{4}{8}$, of the root of the tail, $1\frac{1}{8}$ inch.

Homalopsis leucobalia, Schlegel, Var. (See Plate XL. Fig. 5.)

*Young.*—Above light brownish olive, or greenish grey with single irregular distant brown spots; lips and throat whitish yellow; the lowest three or four lateral series of scales, and the abdominal surface greenish white or pearl-coloured.

*Adult.*—Uniformly blackish olive above, otherwise like the young. Iris dark brown; pupil elliptical, vertically contracted by the light. Tongue whitish.

Scuta 130 to 148; Scutella 26 to 37.

Habit.—*Pinang, Malayan Peninsula.*

The head is very broad, depressed, and the muzzle blunt; the rostral broad, hexagonal, very slightly arched beneath; the superior margin borders the single small elongated anterior frontal, which is of a narrow hexagonal form, broader behind, where it is wedged in between the two broad frontals. The nasals are rather large; nostrils small

crescent-shaped; the vertical very broad, short, hexagonal; occipitals large, elongated with a pair of very broad shields on each side, below which the temples are covered by three smaller shields. The eye is very small, in a half vertical position, with two post-orbitals, one præ-orbital, which extends to the large oval nasal; frenal none, or, when present, excessively minute. Of the five large upper labials, the anterior is the smallest and borders the nasal; the second the præ-orbital, the third the orbit, and the lower post-orbital, the fourth and fifth the temporals. The lower rostral is very small, triangular. The seven or eight inferior labials are much smaller than the upper. The two pairs of mentals are very short. The mouth is small; the teeth are very strong, short and of nearly equal size, except the furrowed last upper maxillary tooth and the anterior teeth of the lower jaw, which are longer than the rest. The trunk is robust, back slightly raised in the centre, the sides sloping, their lower half compressed, the abdomen broad, arched. The scales are smooth, rhombic with rounded points, slightly imbricate; those of the sides have the points bent inwards and firmly adhering to the skin, so as to appear hexagonal. On the anterior part of the trunk they are disposed in 27, on the posterior in 25 longitudinal series. The tail is short, robust, tapering and somewhat prehensile. In the male the sides are compressed, very high in the middle, and the lower surface is flattened, very broad, more so than is the posterior part of the abdomen. In the female it is shorter, the sides less high, and the lower surface less broad. The largest male of a considerable number was of the following dimensions:

| | | |
|---|---|---|
| Length of the head,..... | 0 ft. | $0\frac{7}{8}$ inch. |
| Ditto ditto trunk,..... | 1 | $10\frac{2}{8}$ |
| Ditto ditto tail,..... | 0 | $2\frac{6}{8}$ |
| | 2 ft. | $1\frac{7}{8}$ inch. |

Circumference of the neck, $1\frac{7}{8}$, of the trunk, $2\frac{4}{8}$, of the root of the tail, $1\frac{4}{8}$ inch. With the exception of its colours, the present offers no difference from *H. leucobalia*, from the rivers of Timor. At Pinang it is numerous not only in fresh water and estuaries, but in the sea at some distance from the shore, where it sometimes occurs in fishing nets. It is of sluggish, not fierce habits, and feeds upon fishes and crustacea, aquatic and pelagic. In a young female the oviduct enclosed

4 white cylindrical eggs, which when they were observed contained but yolk; each measured about an inch in length.

HOMALOPSIS HYDRINA, N. S. (See Plate, Fig. 4.)

*Adult.*—Ash-coloured above with a few scattered black spots on the neck; the back and tail with numerous transversal black bands; the lips, sides and abdomen uniformly pearl-coloured. Iris ashy; pupil elliptical, vertically contracted by the light; tongue small, whitish.

Scuta 161; Scutella 34.

*Young.*—Resembling the adult, but the ash-colour of a much lighter shade.

Scuta 153; Scutella 35.

HABIT.—*Sea off Pinang, and the Malayan Peninsula.*

The head is moderately distinct, elongated, depressed, oval with rounded, blunt muzzle; the rostral shield moderate, hexagonal; its lower margin with a central minute tubercle, on each side of which a triangular impression. The upper margin of the minute triangular lower rostral presents a central cavity, and two lateral elevations fitting into the margin of the upper rostral. A similar contrivance in the pelagic serpents enables them hermetically to close the mouth. As in *H. leucobalia*, the single small anterior frontal is elongated hexagonal, broader behind, and enclosed by the rostral, the nasals, and the frontals. Although the nasals are placed laterally, the small arched linear nostrils open vertically, and send a slit to the posterior margin of the shield; the frontals are hexagonal, smaller than the latter; the vertical is the longest of the crown-shields, very narrow, hexagonal, pointed at both extremities, but broader behind; the supra-orbitals are small, narrow; the occipitals are broken up in minor shields: viz. two post-occipitals, in size equal to the occipitals, and a minute conical inter-occipital, enclosed by the four shields, with the broader extremity wedged in between the occipitals. Each temple is covered with two pairs of large shields, of which the lower borders the fifth, sixth, and seventh upper labials. The eye is very minute, prominent, almost vertically placed, surrounded by two post-orbitals, of which the lower is broad pentagonal, meeting beneath the elongated single oblique præ-orbital. Thus none of the upper labials border the orbit. The frenal is moderate, pentagonal. Of the seven upper labials the anterior three

pairs are much smaller than the rest, which suddenly become very large and deep, so as to make the margin of the lip very bulging in a downward direction. The lower ten or eleven labials are smaller than the upper, except the sixth, which is the largest. The chin with two pairs of shields of which the anterior is very elongated; the throat with numerous minute scales. The mouth is small, the dentition resembles that of *Homalopsis leucobalia, Var.* The trunk would be orbicular, but for the narrow flattened abdomen, the scuta of which are angulated, forming on each side a sharp ridge. The scales are very small, smooth, on the neck disposed in 33, successively in 37, but near the root of the tail in 29 longitudinal series. Those of the back are rhomboidal with rounded points; those of the sides lanceolate with the point bent inwards, so as to appear truncated, each scale leaving a small square interval, in which appears the naked skin. The tail is short, much compressed, tapering and slightly prehensile. In the male the sides are very high, and the lower surface very broad, as noted under *H. leucobalia, Var.* On the broadest part there are as many as 21 longitudinal series of scales. In the female this organ is shorter, the sides less high, and the abdomen less broad.

Of three individuals observed, two were captured in fishing stakes placed in the sea off the shores of Keddah, a third was washed on shore by the waves on the coast adjoining my house at Pinang. The largest male was of the following dimensions:

| | | |
|---|---|---|
| Length of the head, ..... | 0 ft. | $0\frac{5}{8}$ inch. |
| Ditto ditto trunk, ..... | 1 | $4\frac{4}{8}$ |
| Ditto ditto tail, ..... | 0 | $2\frac{2}{8}$ |
| | 1 ft. | $7\frac{3}{8}$ inch. |

Circumference of the neck, $\frac{6}{8}$, of the trunk, $1\frac{6}{8}$, of the root of the tail, $\frac{7}{8}$, of the middle of the tail, 1; two eighths from the apex, $\frac{3}{8}$ inch.

It moved actively and without difficulty on the sand, and did not offer to bite. In one examined the stomach contained remains of two small pelagic fishes. In general appearance and colours the present is more closely allied to the pelagic serpents than any other known species. Whether it exclusively inhabits the sea, or, like *Homalopsis rhinchops, enhydrus,* and *leucobalia,* as an occasional visitor, must be a matter of future investigation.

(*To be concluded in our next.*)

*Notes on Places in the Province of Behar, supposed to be those described by Chy-Fa-Hian, the Chinese Buddhist Priest, who made a pilgrimage to India, at the close of the fourth century A. D.; by Captain* M. Kittoe, *6th Regiment, N. I.*

In my former notes on the Viharas of Magadha or Behar, I expressed my desire to examine Rajagriha, Burgaon, Behar and Pawapuri. I have lately been enabled to pay a hurried visit to several of these places, which I was induced to do more particularly, after perusal of extracts from Remusat's translation of the Travels of Chy-Fa-Hian, [made at the close of the fourth century of the Christian era] obligingly furnished by our co-Secretary, Mr. J. W. Laidlay: these extracts are here given for ready reference.

Had I had full leisure and the season been more favourable, I should, no doubt, have been able to have made a better harvest of information than I have by such a hurried trip, with a burning sun and oppressive heat, which forbade much roaming about the rocks and jungles; indeed, as it is, I suffered severely.

It would have been better could I have taken Patna, (Pa-lian-fou, Pataliputra) as my starting point, and from thence have followed in the very tract of Fa-Hian to "the little hill of the isolated rock," but unable to do this, I sent a trust-worthy servant to Behar and have perused Buchanan's notice of the same place and its curiosities; also to another spot held sacred by the Jains called Pawapúri lying between that and Girryek. The remainder of the route I have traced myself.

"Chap. XXVII. Departing from thence (Pataliputra, Pa-lian-fou) towards the south-east nine *yeou yans* bring you to "*the little hill of the isolated rock.*" Now assuming the *yeou yan* to be the डोयन "yoyun" or "jojun" of the Sanscrit, which is equal to four क्रोश or kos, our pilgrim will have travelled thirty-six miles in a south-easterly direction, as near as can be that of Behar; no intermediate spot is mentioned, nor can I hear of any which could have attracted his particular attention; he describes the place (Behar?) as the "little hill of the isolated rock." "On the top of this rock is a stone building, facing towards the south: Foé being seated there, the king of heaven, Chy (Indra), made the celestial musicians *Pant che* play on the *khin*,*

* A kind of lyre.

in honor of him. The king of heaven Chy questioned Foé regarding the forty-two things, drawing every one of them with his finger upon the stone: the traces of these drawings remain there still. In this place there is also a *Seng-kia-lan*, (monastery.)"

Now, first of all, as to the "isolated rock" and the "monastery," these two remarkable objects are surely not to be mistaken! As to the first, there is a bare rock near the site of the fort of Behar, on which is placed a durgah or shrine of a Muhammadan saint, as well as traces of other buildings; there is no tradition concerning its being held sacred by Hindus or Jains, that I could learn, though Behar itself is venerated by the latter: however, the very fact of a "Sheheed's durgah" or shrine of a Muhammadan martyr would strengthen my belief, that some sanctity was attached to the site at the time of the fall of the Moslem there enshrined, such being invariably the case in all parts of India. I, therefore, presume, that this is the "little hill of the isolated rock," and the "Seng-kia-lan" or monastery was the great Vihara from which Behar takes its name, the site of it being now occupied by the ruins of Sher Shah's fort.

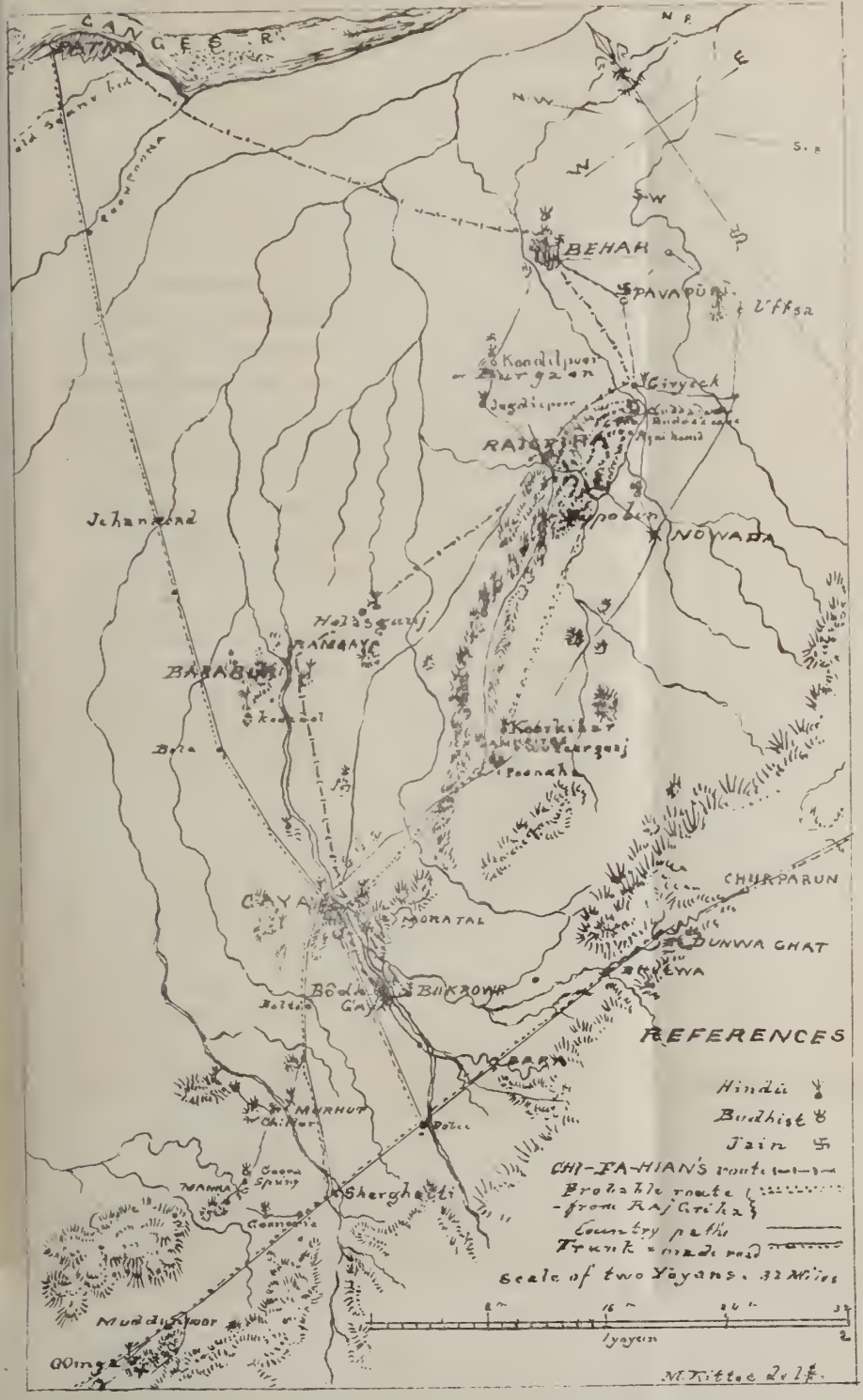
Buchanan (see Montgomery Martin's compilation) vol. I. p. 92, adds, that there is also a large conical mound called a punzawa (brick-kiln) a name given as we shall see to other mounds of the same kind which were undoubtedly Dehgopes or Chaityas: I would refer my readers for more ample details to the above named work: other hills are also named.

I have taken much pains to ascertain, whether Behar anciently bore any other name than simply Vihar, but have been unsuccessful, though I am inclined to think it must have, so greatly have the names of places changed, and so many cities have been razed to the ground, that the locality must ever be a difficult point to decide, nothing indeed except such circumstantial records, as our Chinese traveller affords, could help us out of the difficulty; in this light, for one, then, are his travels valuable, and tracing his track may not be a profitless undertaking.

We must now leave Behar and proceed to the South West.

"Thence proceeding to the S. W. for one *yeou yan* you come to the hamlet of Na-lo. This is the place where Ché-li-foe (Sariputra) was born, and here he entered nirvána. They have here built a tower, which still exists."

Map of part of Zillas Patna and BEHAR. Pl. 41



It is somewhat difficult to follow the track here and to fix Na-lo, for in a south-westerly direction, taking a wide range of that quarter of the compass, we have several places sites of Jain and Budhist relics; first of all, farthest east is "Pawapùri" held sacred up to this time by the Jains, being the spot where Mahivira Swami died: his "churun" or feet marks are placed in the centre of a large tank on an island which is approached by an embankment and bridge, this and other expensive works, would seem from an inscription, (of which I annex a copy) to have been executed about 500 years ago, by rich merchants of the Sarawne east: there are no remains here which would indicate the previous existence of a tower or chaitya, though from Mahavira dying at this place, I should be inclined to think, that it must have been one of sanctity belonging to the Buddhists and Jains, which latter are, I believe, merely a heretical offset. The distance from Behar is three coss, which is less than one yojun.

The next place, further to the west of south is the village of Girryek, and the hill of that name on the top of which is an ancient tower called Jarasindh-ka-bytuki, and attributed to that monarch. There are many ruins of gigantic works here, among which is a causeway leading from the Panchanné rivulet up the hill to the tower, a description of which may be found in Buchanan, vol. I. p. 79, and in the Journal A. S. vol. VIII. p. 353—there is also the site of a large town on the eastern side of the river close to the modern village of Girryek. I am scarcely inclined to suppose this place to be Na-lo, on account of its being so close to the "Gridhra-kuta" and Buddha's cave, together with other remarkable features of the place which would have hardly been overlooked, and it seems strange that the pilgrim should have gone so far out of his way (on to Rajagriha) to return to the "Gridhra-kuta" caves; the direction of Rajagriha, however, is westerly, and so far answers to our traveller's bearings.

Another spot, six miles in a more westerly direction, is that called "Burgaon," where there are several high tumuli, also many fine sculptures, numerous large tanks and wells, the ruins are most extensive; the ancient name of this town was Kùndilpur, and is mentioned in the Bhagavut, and in the Jain books, it is nearly due north of Rajagriha, about 7 miles. I can again hardly think that such a place could have escaped the notice of so observant a person as Fa-Hian. In the

history of Sakya, I find the name "Nulita," a spot near Rajagriha where he expounded some of his doctrines, but here again I am at a loss as no such name now exists, and all knowledge of Budhist history as far as regards the people of Magadha, has long since been lost to them.

There is a place called Juydeespur about two miles from Bargaon, where there are the remains of a large tumulus, and a very fine image of Buddha; this spot takes us even further out of the proper direction, as regards Rajagriha, which is nearly due north and south, distant however about 7 miles.

With this list of noted spots before us, it is difficult to decide which is the one called Na-lo,* if the term "tower" were only applied in one sense, we should fix upon Girryek, but it is evident that it applies to the tumuli or chaityas, and there must have been more than one at this place in Fa-Hian's time, though certainly it is a very remarkable object, being seen for many miles, its direction from Behar as well as with Rajagriha is correct, the distance is a little less, being between 6 and 7 miles, upon the whole, however, I am inclined to fix Na-lo here. We shall now proceed to Rajagriha, "the new town of the Royal residence." "One yojun west of Na-lo, brings you to "*the new town of the Royal residence.*" This town was constructed by the king A-tche-chi: it has two monasteries; on leaving it at the western gate, at three hundred paces you come to a tower, lofty, grand, majestic, and beautiful, which A-tché-chi erected when he obtained somè of the relics of Foè."

I here commence my own route to trace that of Fa-Hian; it was circuitous owing to the low land beneath the hills, which you have to your left hand about a mile distant, the whole way up to the modern village and site of ancient Rajagriha. An immense embankment called "Assurcin" still exists, as well as extensive mounds of bricks and rubbish; sufficient remains of the citadel to show its form, a parallelogram

* In the Páli Buddhistical Annals Sákya is stated to have halted at *Nálanda*, one yojana distant from Rajagaha, when en route from the latter place to Pataligámo (Pataliputra). In the *Na lo* of our Chinese author, there is little doubt that we have the transcription of *Nálanda*; the original word being, as is not unusual in such cases, lopped of a syllable or two. This identification is further confirmed by the circumstance of Sákya Muni holding in this place a discourse with his disciple Sariputra (*Che li foé*), whom he may be supposed to have fallen in with at his native village upon the occasion of this journey. *Na lo* is called by Hiuan Thsang, a subsequent Chinese visitor, *Kia lo pi na kia*. The last two syllables are no doubt the transcription of *nagara*.— EDS.

with numerous bastions; but these latter appear to have been the work of later times, indeed a story is told that Shershah whilst erecting these works, was ridiculed by a milkmaid, who showed him that the adjacent hills completely commanded it, (which they do with artillery). He then abandoned it.

About the distance westward described by Fa-Hian, there exists a tumulus called the "awa," or Punzawa, which is no doubt the "tower," (chaitya) where Buddha's relics were placed by A-tché-chi; Buchanan vol. I. pp. 88, 89, describes this remarkable mound which want of leisure prevented me closely inspecting. This is, no doubt, the chaitya erected over Sákya's relics, built by Ajata-suttu, when he obtained them from Kama Rupa. See history of Sakya's death, vol. XIX. Asiatic Researches. Here then we find one instance of the accuracy of our traveller; let us follow him into "the valley of the five hills."

"Chap. XXVIII. On leaving the town on the south side, at the distance of four "li" you come to a valley which leads to the "five hills:" these five hills form a girdle, like the walls of a town: this is the ancient town of the king "Ping-Cha" (the old Rajgriha). From the east to the west is six "li," and from the north to the south seven or eight; this is the place where "Che-li-foe" and "Mou lian" first met O pi (अश्वजित Asvajit). At the north-east angle of the town the ancients erected a chapel in the garden, where An-pho-ló invited Foe and twelve hundred of his disciples to do them honor; this chapel still exists. The town is entirely deserted and uninhabited."

From Rajgriha, it is about a mile to the entrance of the valley where the hot springs flow, and where a fair is held every third year, having an intercalary month, it lasts during the whole of such month at whatsoever season it may fall; the fair was full during my visit. In May various virtues are ascribed to these springs; barren women resort to them from far and near. Several neat temples have been built within the last century. There are some springs under the eastern hill of the pass venerated by the Muhammadans, who in olden times, built a durgah which is much frequented.

The appearance of this valley and hills is very striking, every peak has a name, and a small Jain temple crowning it, this sect holding the whole neighbourhood sacred, which is very remarkable.

There are two old works in existence, describing this curious tract of country, called the Rajgriha Muhatma: one belongs to the Hindus, the other to the Jains, which I am told, to be widely different. I hope to be able to procure a good copy of each and to compare them. I have had occasion to observe, that the Jains hold most of the places, supposed to be of Buddhist origin, sacred, to wit, the caves of Kundgiri in Cuttuck, Girinar in Kutch, &c. &c.

It is fully two miles or "four li" to the site of the old town which is now called "Hansu Taur," this must have been a very large place when in its glory, and (as described) is skirted by hills, five of which are more conspicuous than the rest, and are called respectively Rutna Girri, Bipla Girri, Baibhar Girri, Sona Girri, and Udhaya Girri, reference to the annexed sketch map will better explain the situation of all I shall have to describe. To proceed, first of all, as to the "chapel" in the northern hill, on the left or west side of the pass is a chamber called Sône Bhundar of precisely the same shape as those of Barabur. There are sockets to admit of timber roofing on the exterior of the cave, and there have been buildings extending to some distance in front: it would be interesting to clear the rubbish here. There are several short inscriptions and some of the shell-shape, one has some resemblance to Chinese, (vide plate) there are no Páli letters, but the cave has been sadly ill used by a zemindar, who tried to blow it up with powder many years ago, hoping to find hidden treasure, and a large piece of rock has been broken away at the very spot where we should have expected to find the inscription,—the rock is soft and easily injured, there are some rude outlines of Budhas cut on it: there is a handsome Jain (miniature) temple, much mutilated, which is also remarkable, for each of the four figures has a vahun or cognizance, the same as those of the Gyani Buddhas, on similar temples or stones of undoubted Buddha origin, unfortunately there is no inscription to help us, (see plate)—this cave is venerated by both Hindus and Jains. Whether it be the temple Fa-Hian alludes to, it is hard to say, for there are remains in the north-east corner likewise.

To the south of this cave near the centre of the town? is a high tumulus, the site of a Dagope or Chaitya, on which is a small Jain temple, it is called by the Hindus Munniarkoop, and by the Jains Nizmile-koop, each have their fables connected with it. From this elevated

Jain chaitya in The cave

The cave is 33'-9" x 17' x 11'-7" to spring of arc | 6'-7"
versed sine of vault 5'-0 Door Ht 6-5" Wth at top 2-10" bottm 3-3"

SÔN BHUNDAR CAVE.

SKETCH MAP OF RAJA GRIHA HILLS &c.

spot, a good view is to be had of the valley and of the pass and plains beyond, looking over Rajgriha nearly due north: to the east the valley grows narrower for a mile or so, and thence two valleys branch off, one leading under the Gidhona peak, so named from the vultures, which perch and build their nests there, the other to Tupobun where there are other hot wells; this place is also held sacred and a fair is held at the vernal equinox. Before reaching the bifurcation of the valley is a spot called the "Panch-pandub" and "Rungbhoomi" from the different ascetics take a colored earth with which they besmear their bodies. Turning to the east, the valley extends for six or seven miles, gradually narrowing to the "Guddelidwar" pass, which opens into the plains at the easternmost end of the cluster, of which more hereafter.

To the north-east is the hill called "Rutna Girri," up the acclivity of this runs a wall of loose stones in a zigzag shape, from the base of which and of the hill is seen an immense embankment called "Nekpay," extending across the widest part of the valley (above one mile) north and south, and from its southern end again a much more massive wall is continued to the summit of the high hill called "Udhaya Girri," along the top of which the same is continued for a great distance, both east and west, whether these walls, which are not high, were intended as fortifications or fences, as said by some, to enclose a Shikargah or preserve, it would be difficult to decide, indeed there are so many curious remains, that one is completely at a loss,—the people ascribe all to enchantment and to demons.

A second high embankment stretches from the "Nekpay" almost at right angles, till it reaches the Sona Girri hill, the lowest and eastern spur of which projects to about the middle of the valley.

Leaving the tumulus and proceeding southward to this cross bank or wall and passing through the same, the road winds at the foot of the Sona Girri close to a low ledge of laterite forming a terrace as even as if cut by masons; this place is called "Bheem Sen's Ukhara," or wrestling place. The many indentations and cavities, peculiar to such formations, are supposed by the ignorant, to be marks left by the wrestlers. Continuing to the southward towards Udhaya Girri, the road is formed by the bare rock in which occur many short inscriptions in the shell pattern, and other curious forms but much worn and some overgrown with moss and rubbish. I deem these to be great curiosities, and think that

if a clearance were made more (and perfect ones) would be discovered. I copied one or two which are represented (see plate). About a quarter of a mile further, is a tumulus overgrown with jungle and near to it remains of some extensive enclosure and buildings. This tumulus may be one of the "*towers*" alluded to by Fa-Hian; at this spot the road has wound to the south-west, and the valley forms a large amphitheatre; continuing for half a mile in a more southerly direction, you arrive at a narrow rocky gorge and bed of a Nulla called "Bau Gunga," which empties itself into the plains just beyond, at the foot of the Udhaya Girri hill; the great wall at this place is very thick and extends for a considerable distance to the south; this spot is held sacred by the Hindoos who say that Bheem drove his "ban" or dart into the rock upon which water rose from "patal," [the depth of the earth;] this is one of the spots visited during the triennial fair.

Having now described the valley, &c. we must return to Fa-Hian's narrative—he says:—

"Chap. XXIX. Entering the valley and going beyond the mountains fifteen li S. E. you come to the peak of "Khi-tche." At the distance of three li, from the summit of this mountain there is a cave facing the south. Foe sat there in meditation. At thirty paces to the N. E. there is a stone grotto; "*A nan*" (Ananda) sat there meditating. The demon of the Heaven, "*Phi siun*" (विश्वन), changed into a vulture, stopped before the cave and terrified *A nan*. Foé by his supernatural power opened the rock, seized A nan by the arm with his hand, and stayed his fear; the traces of the bird and the hole where Foe put forth his hand exist to this day. It is thus that the hill came to be named "the hill of the cave of the vulture." Before the hill is the throne of the four Buddhas. All the Arhans had also there every one his cave, where they sat to meditate. The number of these caves is several hundreds."

With reference to the foregoing, and the notes by M. Remusat and others, I first of all made every possible enquiry to little purpose, except that two caves existed about seven miles distant at the eastern gorge of the valley called the "Guddeh-dwar" or ass's gate before alluded to, I therefore determined to examine it: having no horse and it being impracticable for my palkee, I took guides and proceeded on foot at four P. M. and after two hours' good walking I reached the

RAJGRIHA

Pl 43.

on the rock

fig 1

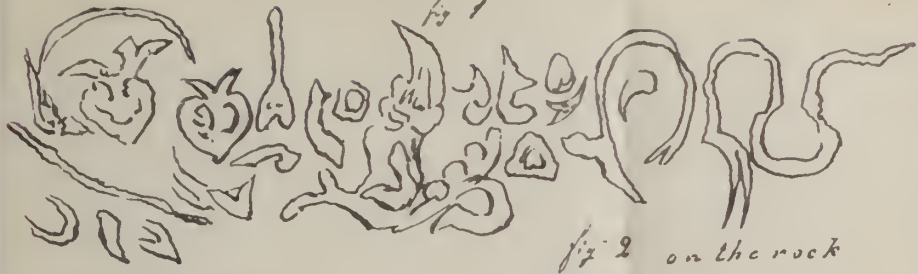


fig 2 on the rock

fig 3

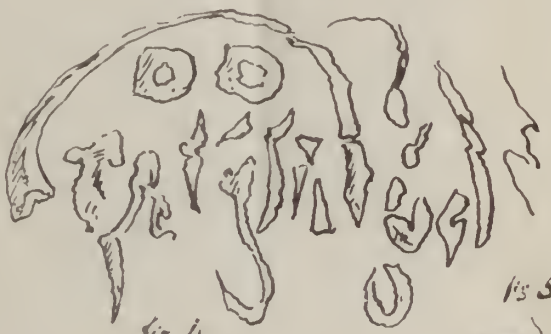


fig 4

fig 5

fig 8

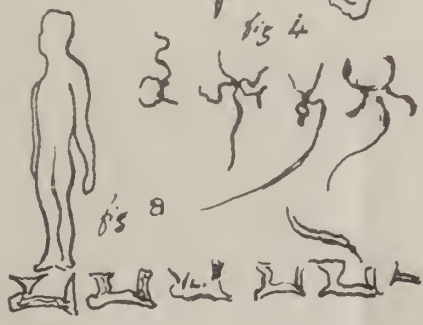
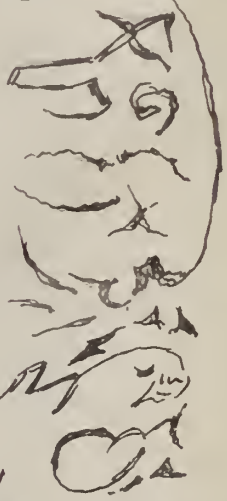


fig 6



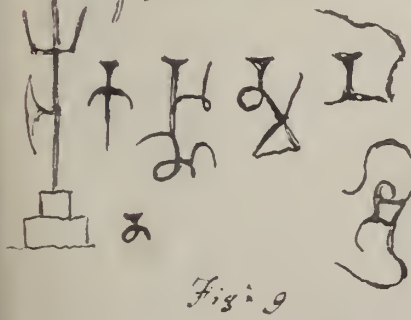


fig 7

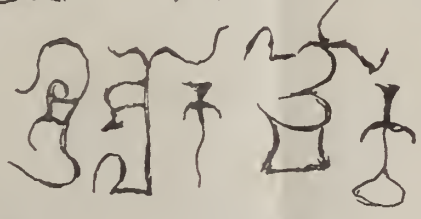
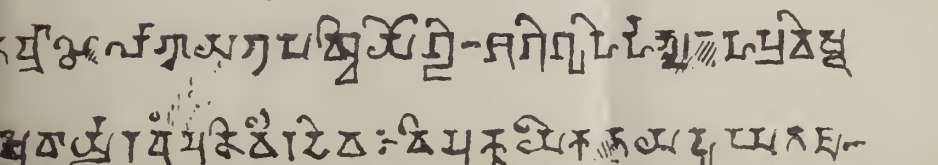


Fig: 9



MK. delt & Lith.

"Guddeh-dwar," a narrow passage between scarped rocks which had in former times been enclosed by an immense wall of loose rubble; this gorge opens out into the plain with high, barren, rocky hills, on either side, forming the easternmost of the Rajgriha cluster and range: the one to the left or north being that on which Jarasindha's tower stands with other ruins already described under the head of Girryeck.

The distance travelled will have been close upon "fifteen li" or about seven and a half miles as stated by our pilgrim: passing through the gorge and about half way up the steep face of the north hill under Girryeck, two caverns appear facing the south, and over one is a curious cleft in the rock which would seem to answer Fa-Hian's description, except his distances, up to, and between the caves, nor are there other caves or grottos, nor the throne of the previous Buddhas. However, it is possible that these caves have a northern entrance; for the largest which is alone accessible, has a passage apparently cut through the hill, which I was unable to penetrate, not only owing to fatigue and blistered feet, but it would be requisite to be provided with chloride of lime, torches and other precautions to enable a party to explore it. I think it would be found to open out opposite the highest peak south of Jarasindha's tower; this peak is surmounted by either a terrace or the remains of a Dagope, which may be the very "throne" alluded to by Fa-Hian, as its distance from the path below would answer that given: I think then we may fairly decide that these caves are the identical ones described by him, there are small cavities here and there which may have been used by anchorites but not several hundreds. By "stone grottos," may be meant small habitations made of stones piled together; indeed I think it more than probable, that the whole of these hills were inhabited by "rishis" or devotees, the name "Tupobun" itself implies it, being a corruption of "Tupissia" and "Vana" or forest of devotion.

There are some more hot springs beneath the southern side of these easternmost hills, and about five miles further south in the plains is a spot (a tank) still visited and held sacred by the Jains.

As to the name "Gridhra-kuta" the present one of "Guddeh dwar" may be a corruption of "Gridha dwara:" vultures swarm alike on all the ragged peaks and particularly on these.

Chap. XXXI. "Thence proceeding to the west four *yeou yans* you come to Kia-ye. This town also is completely deserted."

Now if we take the distance of four yojuns to Kia-ye (Gaya) modern Gaya would answer, but if we are guided by the direction, it is too much to the southward of west, if on the other hand we be guided by the bearing and less by the distance, we should decide that by "Kia-ye" was meant the ancient Gaya now known as "Ram Gya," which is on the west or right bank of the Phulgo and a mile to the north of the Barabur hills. There is a tradition that all ceremonies were formerly performed here; a fair is held in the month of April, at which still, the lower casts perform the "Pind" or ceremony of offering the funeral cake. Hoolasgunge, which is further east, consequently nearer the distance given (of four yojuns) is by some supposed to have been ancient Gaya, (see Buchanan, Vol. I. p. 100.) It is strange that Fa-Hian mentions neither the Phulgo (or Mohana) nor its branch stream which, had he gone to Ram-Gya, he must have crossed; it is also remarkable that he does not allude to the Barabur caves or hills, places which must have been of note even in his time, however, it is possible that they were in possession of heretics or of Hindus, for from the later inscriptions we learn that Sardula Varma, Anund Varma, &c. appropriated the caves and set up brâhmânical images, the same reason may be assigned, for no mention being made of Kundilpur or Burgaon, but let us now turn to the south.

"Going to the south twenty li, you come to where the Phou-sa spent six years in mortifications; the place is woody. Thence going three li to the west you come to where Foé descended into the water to bathe; the gods held branches of trees over him when coming out of the pool (or tank). Two li further to the north, you come to the place where the young women of secluded families offered Foé rice and milk: thence to the north two li more, to where Foé sat on a stone, turned to the east, under a great tree; the tree and the stone exist to this day. The stone is six feet long and six broad. In the kingdom of the middle (Magadha) the temperature is so equable that trees last several thousand years, even ten thousand."

We now come to the most perplexing part of our pilgrim's narrative, for not only do his bearings but his distances puzzle us, the indiscriminate use of li and yojun is one cause.* Now if Hoolasgunje or

* With regard to the length of the *yojana*, we must not expect to find extreme precision in the narrative of Fa-hian. That traveller no doubt set down his distances from

Ram-Gya be Kia-ye and a "li" be equal to as much as half a mile, we should have ten miles south, which would only bring us within six miles of the Vishnupad, four of the Ramsila hill, and twelve of Budh Gya which the others believe to be the holy locality (see Vol. XIX. Asiatic Researches, p. 187.) It is there mentioned in a note, that there are seven places held sacred called the "Satta Stana," three of which only answer to the description given by Fa-Hian, viz. the two trees and the tank where Buddha was protected from the rain by a dragon: (Seshnag?) the Vakeels, however, name four, as the only spots now visible: the distances of all are given except of the hill and Bukrowr "(Bagaroo Goun)," this hill is no doubt the same under which is the lake called Mórátal.

Fa-Hian leaves you in doubt as to whether by "pool" (where Buddha performed his ablutions) was meant a pool in the river, or a tank or lake; the Burmese seem to believe in the latter, though in the Tibetan books the "Nirajuna" (Lillajun) is distinctly mentioned; but to return to the narrative.

"Thence going to the north-east half a *yeou yan*, you come to a stone grotto; *Phou sa* entering it and facing the west, sat with his legs crossed, and thought within himself "in order that I should accomplish the law, I must have a divine testimonial." Immediately his shadow depicted itself upon the wall; it was three feet high; the weather was clear and brilliant; heaven and earth were both moved, and all the gods in that space exclaimed, it is not in this place that all the Foés past and to come should accomplish the law."

Now, before proceeding further, I must remark, that if Buddha Gaya is the spot meant by Fa-Hian, we must give up all idea of his having gone west from Rajgriha and assume that his route was continued from the Ban Gunga or from Buddha's cave (the Guddeh-dwar) directly west to some deserted place opposite modern Gaya, and then have turned south

popular estimation, and the *yojana* will therefore vary in different localities precisely as we find the Kros to do at the present day. From the comparison of the actual distances of well identified places in the north-western Provinces with those given by Fa-hian, Capt. A. Cunningham (Jour. Roy. As. Soc. Vol. VII. p. 243) determines the length of the ancient *yojana* to be a fraction more than 7 English miles. This will be found rather too much when applied to Fa-hian's distances in Magadha. Mr. Turnour (Mahawanso, p. 30 of the glossary) makes the *yojana* equal to sixteen E. miles; a valuation manifestly excessive.—Eds.

along the right bank of the Phulgo (the Lillajun is here so called) to Bukrowr and Buddha Gaya, which is directly opposite across the Lillajun, and here again he makes no mention of that great river (it is next to impossible (now that no tradition even is left) to trace each particular spot, it would seem certain however, that one tree was at Bukrowr and the other at Bodh Gaya, which tree is now called the Sutjug Peepul, the first I assume to be "Ni-kiu-liu" "the tree of all the Buddhas." The second, Pei-to "there have been Chaityas at both places, and no doubt long before Fa-Hian's time, there was, as I have mentioned in my "Notes on the sculptures of Budh Gaya," more than one very ancient Dagope, and I believe the trees to have had enclosures as represented in those sculptures, also in the caves of Kundgirri in Cuttack and in other Buddhist sculptures. The hill beneath which is Moratal lake, lies about two miles or less north of Bukrowr: there are spots on this hill still venerated by the Hindoos, and as it runs north and south, consequently faces west, and as the distance answers tolerably well, I should be inclined to consider it to be that alluded to, on which "Buddha sat facing the west."

Bukrowr is due east of Buddha Gaya, having only the wide bed of the river between them, the large tumulus and remains of a Dagope may be three furlongs or even half a mile due east of the great Budh Mundir and Peepul tree. About a furlong east by south of the tumulus is a tank held sacred by both Buddhist and Hindus, it is not far from the banks of the Mohana, on the narrow tongue of land which extends up from the junction of the two rivers, where both take the common name of Phulgo.

There are several large tanks at Budh Gaya and the mounds of brick, clay and pottery extend over a very great surface, the great Dagopes must have stood very close to the tree: and were excavations carried on, it is possible many more curious sculptures would come to light,—but to continue.

"To the south-west a little more than half a *yeou yan* is the Pei-to tree where all the Foés past, and to come, should accomplish the law. Having said this, they sang to him and showed him the way, retiring. The *Phou sa* rose, and when he was thirty paces from the tree, a god gave him the grass of happy omen; the *Phou sa* took it and advanced fifteen paces further. Five hundred blue birds ap-

proached, flew thrice round him and then flew away; The *Phou sa* advanced to the tree Pei-to, held out the grass of happy omen towards the east, and sat down. Then the king of the demons sent three lovely damsels, who came from the north, to tempt him, and himself also came with the same purpose. The *Phou sa* struck the ground with his toes; the crew of the demons recoiled and were dispersed, and the girls were transformed into old women: for six years he subjected himself to the greatest mortifications. In all these places men of later times have erected towers and carved images which exist to this day."

I was at first inclined to think that Gaya-proper, was the site of some of Buddha's exploits, and that the Vishunpad was the very place where Buddha left the impression of his foot; that the tree called Achaih But अक्षयबट where the "Pind" offerings are now made was the tree alluded to in this chapter, but the distance from the Ram-Gaya hill is too short, though the direction would be correct, however as both better answer for Budh Gaya, we may again consider it more probable that the latter is the proper spot. The chapter continues thus:—

"In the place where Foé having accomplished the law, rested seven days to contemplate the tree, and obtained the joy of extreme celestial beatitude; in the place in which he passed seven days under the tree *Pei-to;* in that where the gods, having created the edifice of seven precious mansions served Foé seven days; in that where the blind dragon with brilliant scales surrounded Foé for seven days; in that where Foé, being seated under a tree "Ni-kiu-liu," upon a square stone and turned to the east, the god Brahma came and prayed to him; in that where the four kings of the gods offered him a dish; in that where the chief of five hundred merchants presented him with parched rice and honey; in that in which he converted Kia-se and his brothers, master and disciples to the number of a thousand; in all these places have towers been erected."

With reference to the different places here enumerated, it seems clear that they must all have been close at hand, indeed several of them are no doubt, those described in a more fabulous and extravagant manner by the Burmese as the 'Satta-Stana,' for instance 'the square stone under the tree' is converted seemingly into the 'Golden Throne.' The 'Edifice of the seven mansions,' into the golden mansion, the spot

where the damsels offered milk and rice, perhaps tempted him; the dragon with brilliant scales is, no doubt, the snake Sehsa, which protected Buddha from the rain with its hood. The "Pei-to tree" is, no doubt, "Buddha's holy tree," and the place "where goats used to graze" is probably Bukrowr. I must now again repeat that there is an ample extent of ruins to warrant the supposition, that there must have been numerous buildings around the holy tree, indeed the fact of three distinct and very ancient sets of carvings and fragments of Dagopes of the earliest forms, would strengthen our belief in the former existence of numerous edifices, such as described by Fa-Hian.

We now come to a further enumeration of places, where buildings had been erected by the Buddhists in early times.

"In all these places they have also erected towers. 1st, In the place *where Foé obtained the Law*, there are three Seng-kia-lan (Viharas); in each is an establishment for the priests, the number of whom is there very great. The people supply them with abundance, so that they lack nothing. They keep precepts rigidly; they observe the greatest gravity in all their deportment; in rising up, in sitting down, and in going abroad." This would seem to be at Buddh Gaya; but it is doubtful, whether the remaining places enumerated, as follows, were so.

"The four great towers which have been erected in commemoration of the holy things done by Foé, during his sojourn in this world, have been conserved to the present moment (A. D. 408) since the time of his 'Nirvana' (death.) These four great towers are—first, where he was born—second, where he obtained the law—third, where he turned the wheel of the law; and fourth, where he entered Nirvana" (died).

Now it would seem, that this does not, as I have before hinted, allude to Dagopes or Chaityas at Buddh Gaya exclusively, for in the first place Sakya, i. e. Buddha was born at Kapilavastu somewhere, it is believed, in the Oude territory. As to the second, most probably Budh Gaya was the place; by the third I should have little doubt but that Varanasi or Benares was meant, for all the Buddhist historians record this event of the prophet's life to have taken place there, i. e. his "turning the wheel of the law;"* the present tower of Sarnath erected evidently since Fa-

* '*Turning the wheel of the law*' is a metaphorical or mystic expression, equivalent when applied to a Buddha, to 'commencing his ministration.' Benares was no doubt the

Hian's time, cannot for this reason be that alluded to, but there have been other towers, of which nothing but the bare traces now remain. By the fourth tower, (upon equally if not stronger grounds) must have been meant that at Koosha Vihara in Assam, indeed we know that it was there that Sakya obtained "Nirvana" (died). This happened beneath two Sál trees; we are further told that a Dagope or Chaitya was erected there over his ashes, and which were subsequently distributed over the country, and for which armies were even brought into the field. See life of Sakya, Vol. XIX. Researches, p. 317. I do not think the text warrants our supposing that four great towers were erected in commemoration of the four principal events of Budha's life at Gaya.

We must now turn to Chapter XXXIII, in which we learn further of the vicinity of Budh Gaya.

"From the Pei-to" tree you proceed three li, to a hill called the *cock's foot* (कुक्कुटपद्) "Kookootpada," it is here that the great Kya Che (Maha Kasyapa) pierced the mountain for the purpose of entering it, and suffered none else to enter the same way. At a considerable distance from this is a lateral hole, in which is the entire body of Kya

scene of this event in Sákya's life, as the following couplet from the *Lalita vistára* will testify:

वाराणसीं गमिष्यामि गत्वा वै काशिकां पुरीं।
धर्मं चक्रं प्रवर्त्तिष्ये लोकेषु प्रतिवर्त्तितं॥

"I will go to *Benares*; having arrived at the city of Káshi, I will turn the wheel of the law, which is revolving among mankind." (J. A. S. vol. VI. p. 572.)

The tower to commemorate Sákya's apotheosis was unquestionably, on the banks of the Gunduk, in the neighbourhood of Bettiah: and not in Assam as Tibetan writers allege. Fa-hian names the place *Kiu i na kié*, and Hiuan thsang, *Kiu chi na kie lo*, an obvious transcription of कुशिनगर *Kusinagara*. Mr. Liston in J. A. S. vol. VI. p. 477, describes some Buddhist remains at a village named *Kussia*, in Gorakpore, consisting of a pyramidal mound of bricks and other objects which seem well worthy of further investigation. These have reference, according to popular tradition, to *Mata Koonr*, which Mr. Prinsep took to be a corruption of *Kumára*, the god of war,—'the defunct Kumara.' Professor Wilson, however, thinks that *Mata Kuaur*, the 'dead prince,' applies to Sákya Sinha. The only difficulty in regard to this latter ascription is, that the term *prince* is never applied by Buddhists to Sákya, after his adoption of ascetic life. It is to be hoped that further enquiry will clear up this point. The subject of antiquities is by no means exhausted in the neighbourhood of the Gunduk—the *Hi lian* of Fa-hian, (हिरण्य *hiranya*, gold,) the *Hiranna-wattiya* of the Pali annals, and without doubt the *Erranoboas* of the Greeks.—Eds.

Che. The earth outside the hole is that over which Kya Che washed his hands: when the people of the country are troubled with headache, they rub themselves with this earth and the pain goes."

As the Pei-to is the starting point, and no particular direction mentioned, I assume that the cluster of hills at the southern extremity of Gaya proper, called Burrumjooeen are those alluded to, although the distance of three "li" is too short by half or more. The old town of Gaya in which is the Vishnupad, stands on a rock, a spur of the larger hills, under which the Hindoos believe, that the demon Gaya Asura is confined by the weight of Vishnu's foot.

By Kya Che the translators from the Chinse text conjecture, that Maha Kasyapa is meant,* but I am inclined to think, that it is this said Gaya Asur of the Hindoo legends. The absurd story of all the divinities failing to subdue the monster till Vishnu put him down with his foot, appears to me to be an allegory expressive of the final triumph of the Vishnuvites over the Buddhists, Vedantis, Saivas and other sects. The first and last named must have predominated here from the numerous lingas and yonis of every age and form, as well as fragments of Budhist carvings. This subject is worthy of consideration, we have the common legend as above quoted, we have also Fa-Hian's testimony. As to what existed fourteen hundred and fifty years ago, he seems to speak of Kya Che as a law-giver of his own sect (Budhist), and does not lead us to suppose Gaya to have been in other hands than those of Buddhists.—"Kya Che" seems more to resemble the word "Keechue" or demon than any other. I should be inclined to think that allusion is to a story having a common origin with both sects—Brahminists and Buddhists, who in all probability, only differed (in early times) in points of doctrine and sacrificial practice. Orthodox Hindoos only acknowledge a very small space at Gaya to be sacred for them, which is alluded to in the Purans and in the Mahabharut—this information obtained from a learned Pandit, from the outskirts of Calcutta, who told me, that not more than two or three of the forty-five spots, at which most pilgrims offer the funeral cake, i. e. perform the "pind," are proper, the rest belonging to the Buddhists and Jains; for instance, the hill called Burrum Jooeen, before described, is properly Bruhm Jain. The very one, we may suppose, Fa-Hian to be describing, on the top is a

* There is no doubt upon this point.—Eds.

modern temple, near to it are two masses of rock, between which some pilgrims and others force themselves, believing that none but true born can accomplish the feat, in other words, those who fail are considered bastards.

With regard to the custom mentioned of people using the earth where "Kya Che" washed his hands, as a remedy for head-ache, &c. the practice still exists at the banks of a tank under the hill called Rookhmooni and close to the Akhayah But tree, where the final "pind" ceremony is performed—but to return to Fa-Hian.

"In this hill also to the west, is the abode of the Arhans; the clergy of Reason, (a sect) come from all kingdoms of those parts to worship Kya Che; those who come with their minds embarrassed, see during the night time, the Arhans coming to discourse with them, and to solve their difficulties, which having done they disappear again forthwith: the forest which covers this hill is very thick; it abounds with lions, tigers, and wolves, so that one cannot travel there but with fear."

With regard to there having been habitations on the hill, to the westward, there are ample traces both to the west and to the north and east, that they were covered with jungle even as late as when we took the country, and swarmed with wild animals of prey are facts well known, though there is scarce a stump of a shrub to be seen now nor on any of the hills within twenty miles, owing to the great demand for fuel; there are still leopards, wolves and hyenas, and occasionally a tiger has been seen; but the lion is an animal unknown in these regions, except by name as a cognizance of the gods.

It will have been remarked that Fa-Hian talks of a peculiar sect as possessing the hill. I have already mentioned, that it is supposed to have been a place of Jain worship, may not then the Jains have been in existence at that period as distinct from the Budhists? at any rate the fact of different sects existing in the fourth century of our era, is hereby established. I have now concluded the pilgrim's journal as far as it relates to the Buddhist localities of zillahs Behar and Patna. I have tried to follow him as closely as possible, and I trust I have done so successfully. I could have wished to have been able to examine several spots around Gaya, particularly the Morah Tal hills, but this could not be effected. With the other places I am familiar enough, though I could still, no doubt, glean much more instructive matter if I

had the opportunity; but nothing short of excavating the mounds or tumuli (an expensive operation) would with any probability of success lead to satisfactory results.

I must once more remark on the silence of Fa-Hian regarding the places which we might suppose to have belonged to sects, perhaps anti-Buddhist, he must have travelled past, such as Kundilpoor (Burgoun) Barabur and its ancient caves—which, in Sakya's time, must have been used by his followers, the inscriptions themselves point to their having been excavated for Buddhist asecties at a very early period.

*Inferences.*

From the foregoing we draw several useful inferences as regards this country, at the close of the fourth century for instance, that a belief existed of four previous Buddhas, a point I believe to have been disputed; secondly, that several of the great events of Sakya's life, both probable and improbable, were believed in at that early period of our era; thirdly, that up to the same time Buddhism was flourishing and its votaries unmolested; fourthly, that holy places now claimed by the Hindoos and Jains, were in those days considered as sacred to Buddhism. These are the leading points, no doubt that a careful examination of the whole narrative would lead to a clearer view than has hitherto been had of the state of India at the commencement of the Christian era. We must however, be constantly at a loss in tracing places from the curious orthography of the Chinese language,—the same remark is applicable to the Tibetan and Burmese volumes, and this is a sad obstacle. I would fain hope, that some of our brethren in China may interest themselves in the search for works in that language concerning India, and in preparing fair translations, which can alone be done by persons on the spot; and it is further to be hoped, that those who form the forthcoming mission to Tibet, will not lose the opportunity of searching for ancient Sanscrit works in the monasteries of that country, works known to exist and which had Mr. Csoma Korosi been spared to us, we should ere this have possessed in original or by copy; but this is a digression which my readers must pardon, and I herewith take leave of the subject.

*Some Account of the Town and Palace of Feerozabad, in the vicinity of Dehli, with Introductory Remarks on the sites of other Towns. By* Henry Cope, *Secretary Archæological Society of Dehli, and* Henry Lewis, *Deputy Commissary of Ordnance and Member of the Society.**

In no country of the world, or at least in no country with whose history we are sufficiently acquainted to pronounce authoritatively, are there so many monuments of the inordinate vanity of a race of foreign conquerors as in India;† and in no part of this vast empire has that vanity been more pre-eminently displayed than in the immediate vicinity of the modern town of Shahjehanabad, the last, and probably, the greatest specimen of the vain-glorious spirit of its founder, certainly that to which has been secured a more lengthened existence than was enjoyed by any of the towns and citadels that went before. These were at times the capitals of nearly all India, at others merely the chief cities of a territory smaller than many zumeendarees of the present day, yet all are spoken of by the host of historians who have written about them, as the glory and pride of the land; the centre of civilization, and in turn the scenes of the most mighty revolutions which have befallen the mightiest empire in the world. At one time we have the Prince in power, or the founder of a new dynasty, seeking the highest available hill (as in the case of Prithu Raj's palace and Toglukabad) whereon to erect his castle, if not his town, as the site best suited for defence; at another selecting the plains at the foot of those hills, (as Jehanpunnah, and old Dehli,) or the banks of the River Jumna, (as at Kelokheree, Mobarikabad and Feerozabad,) on which to locate himself on account may be of their superior advantages in regard to the vast amount of supplies required for such an immense population; but almost every one of them was actuated by the same all-predominant feeling of pride, all seemed anxious to hand their names down to posterity as the founders of new cities, while some

* Read before the Archæological Society of Dehli, at their meeting of the 9th August, and communicated by that Society.

† The British are specially excluded from this remark, were they to leave India at the present moment, they would leave every little behind them of an architectural character that would stand the ravages of thirty years.—H. C.—H. L.

were swayed by some momentary whim engendered by local circumstances, of which few records are in existence.

In some of these towns and forts were displayed all the architectural beauties that time, which unlimited resources, and the particular taste of each sovereign allowed of his indulging in ; and the most expensive materials were brought from a great distance at a vast cost, to give them the most gorgeous appearance ; while other structures were raised in the most massive, but at the same time, rude style, the result probably of the pressing necessities of the times, especially the frequent and distant wars in which most of the sovereigns of Dehli were continually engaged, and which left them little time for the cultivation of the arts of peace. In these were used the coarse materials on the spot, and the monuments of the glory of former kings were frequently destroyed to save the trouble of quarrying new stone. For in this manner alone can we account for the comparatively few remnants we find at the present day of the massive battlements that must have surrounded several at least of the towns of Delhi in succession, or of the huge piles of buildings that must have been reared within their walls.*

There are nevertheless numerous historical proofs, supported, notwithstanding the extensive devastation to be traced in many directions, by local evidence of the most convincing character, that the several towns, built from time to time, in the neighbourhood of the present Delhi, cannot have been less than thirteen, while tradition, which may, on investigation, turn out partially correct, adds some three or four more to the number. Of the extreme desirableness, in an archæological point of view of fixing the locality of these several towns and forts, and of the value attaching, in a historical point, to researches, which shall identify these localities, with the names that occur in the records of the times, there can, it is presumed, be very little doubt. The historians of the Indo-Mahometan middle ages have placed many of those names on record. They have, in several instances, described the relative positions

* Seree, Jehanpunnah and Old Dehli, must, at the time of the invasion of Taimoor, have occupied a space at least seven miles in length, by some three or four in breadth. The three towns had thirty gates opening to the country or into one another. We hope some day to give an accurate outline of these cities. It is not to be wondered that Saiud Moobarik found it necessary to build another town soon after Taimoor's invasion ; *he* must have left Old Dehli almost a heap of ruins.—H. C.—H. L.

of the various capitals of the Indian empire, that have flourished, under the several names imposed upon them by the caprice or vanity of their founders, and a short review of these records may not be out of place in this paper, introductory, as it is hoped it may prove, to further researches on this interesting subject. All allusion to traditional evidence is omitted. We find it recorded that Kootub-ood-deen Eibuk the first permanent Mahomedan conqueror, and his almost immediate successor, Shumsood-deen Altumsh or Altumish, both inhabited the fort which the first of them wrested from Rajah Peethowra or Peerthee Raj (from 1191-1236); we find that Gheias-ood-deen Bulbun (1266-1286) erected another fort and built another town "in which were magnificent buildings;" amongst them the celebrated "Ruby" or "Red Palace;" this town will prove, in all probability, to have been the one so long designated in after ages, and when new cities had sprung up, as "Old Dehli," and the site of this place may perhaps be traced through the existence at this day of the village of Gheiaspoor, near Hoomaioon's tomb and the Deenpunnah fort. We find that Kaikobad, his grandson, (1286-88) fitted up a Palace at Kelokheree (Gunglookheree, according to the Ayeen Akhberee) the site of which is clearly indicated by a remark in that work to the effect that Hoomaioon's tomb was within its limits, and this indication is confirmed by the existence of a place of that name, a little beyond Gheiaspoor. The palace built by Kaikobad was then so close to the river that his body was thrown out of one of the windows into the stream.* We find that his successor, Julal-ood-deen Feroz (1288-95), having no confidence in the loyalty of the people of Dehli (the Delhi of Gheias-ood-deen Bulbun?) continued to reside at Kelokheree; this he strengthened with fortifications, and beautified with five gardens, and terraced walks by the side of the river. It is said that the owners followed their king's example, and built houses around his palace, so that Kelokheree became known as the new city (of Delhi), and that Julal-ood-deen having been induced, by the conduct of the neighbouring citizens his subjects, to place greater confidence in them, went on an appointed day to "old Dehli," where he

* The Jumna has taken a considerable turn eastward since then. There is pretty conclusive evidence that, at one time, the main stream flowed by Feerozabad, Deenpunnah, Kelokheree and Mobarikabad, forming doubtless, on account of the huge bund inland or westward, a very fine and attractive sheet of water.—H. C.—H. L.

ascended the throne in *the* Palace; refusing at the same time to take possession of the "Ruby Palace," on the ground that it was the private property of the family of Gheias-ood-deen Bulbun. He returned to Kelokheree in the evening of the *same day*, so that "old Dehli," and Kelokheree must have been very near each other, another presumptive proof in favor of Gheiaspoor of the present day being "old Dehli."* We find that on the murder of Jellal-ood-deen at Manikpoor, by his nephew, the famous Allah-ood-deen Ghilzaie, the widow of the former proclaimed her young son king, and, accompanying him from Kelokheree to Dehli, that is from the then new, to the old city, seated him on the throne in the "Green Palace," so that there were at that time no less than three royal Residences in the same town:—one *the* Palace (in which Jellal-ood-deen ascended the throne, and which may have been the "White Palace" mentioned in the reign of Moez-ood-deen Barram), the "Ruby Palace," so often alluded to, and the "Green Palace." Allah-ood-deen, on the flight of his young cousin, entered Dehli in triumph, and ascended the throne in the "Ruby Palace," (1296-1316.) We find it mentioned in the Ayeen Akhberee, though the fact is singularly enough not even alluded to in Ferishta, that this Allah-ood-deen built the town and fort of "Seeree," and the site of this place is most clearly fixed by the record in a subsequent part of Ferishta, that the tomb of Kootub-ood-deen Bukhteear Kakee (the saint to whom pilgrimages are still made at the Kootub village, so well known for its splendid Kootubmeenar) was situate in the fort of Seeree. Another collateral proof of this location is that the tomb of Allah-ood-deen is still in partial existence near the Meenar. It is recorded of Allah-ood-deen, that Palaces, Mosques, Universities, Baths, Mausolea, forts and all kinds of public and private buildings sprang up, during his reign, as if by magic. After Seeree follow Toglukabad (1322) Mahomedabad, (1325-1351,) Adilabad, and Feerozabad (1354) all pretty well known and of which last, more hereafter. Ten years after the death of the founder of Feerozabad occurred the invasion of Taimoor (1398)of which we have ample records in that king's own institutes and in the work of Shereefood-deen, Alee-Yazdu who singularly enough, gives details regarding the then state of Dehli, which are not to be found

* The "old Delhi" here and elsewhere alluded to, must not be confounded with the town now so called, which will prove to have been founded by Sher Shah.—H. C.—H. L.

in any other work, and the details which he gives respecting Seeree, Jehanpunnah, the Houz-khan, and old Dehli will be most valuable in hereafter identifying the ground on which these several places were situate. After this we leave Mubareekabad, built by the second Saiud, in 1436, on the banks of the Jumna, the site of which must have been most likely, either below Kelokheree, or above Ferozabad. We find that Hoomaioon, *built* (1533) according to Abul Fazl, (but *repaired* would probably be the more correct expression, as this will probably be found to have been the fort of "old Dehli" or "Gheiaspoor") the fort of Indraput, which he called "Deenpunnah," that on his expulsion by Sher Shah (Abul Fazl calls him merely Sher Khan, looking upon him in the light of an usurper,) that sovereign destroyed Seeree, the town and fort built by Allah-ood-deen, and laid the foundations of another town (1542-1545); this the author of the Ayeen Akhberee tells us, was for the most part in ruins in his time, and will probably turn out to be the town, of which the two extreme gates (N. and S. nearly) are still in existence one (the Kabulee) near the Dehli gate of Shahjehanabad, and the other a very splendid edifice (the Muthra gate) near the western wall of Deenpunnah. The fact of this town having so soon gone to decay may be easily accounted for by the fact of Akhber having transferred the seat of Government to Agra; while the absence, at Agra and elsewhere, during some twenty years, of Sekunder Lodie, and his short-lived successors, immediately before Baber's arrival in India, may have rendered it imperative on Hoomaioon, to provide a suitable place of residence on his coming to the throne.*

It has been observed above, and will be gathered from the details which follow, that much is to be gleaned from some of the historical records of the time, and no doubt more accurate information will be obtained, by a careful examination of the many authors, who are as yet but little known, at our disposal; but in consequence of some of the writers of these records being personally unacquainted with the places they named, while the original works of others have had the serious misfortune of falling into the hands of copyists, on whom alone we have now to depend, and who themselves rarely knew any thing of the neighbourhood

* The utility of this sketch was suggested by the perusal of an admirable letter from Mr. H. M. Elliot, Secretary to Government to the Secretary Archæological Society, in which many of these point are touched upon.

of Dehli. Considerable confusion has thus naturally arisen, and it has become a matter of great difficulty to identify many names and places, which nothing but a careful local investigation can overcome. Translators again,* frequently affording the only means of obtaining information, have contributed considerably to increase the existing confusion, by attributing little or no importance to the accurate details in their original; they probably looked on these details as of mere local interest, and consequently slurred them over carelessly, or omitted them altogether in a very culpable manner, while the wretched orthography, adopted by some of those who have been otherwise more careful, has so entirely obscured the original and proper nomenclature, as to render it almost a matter of impossibility to recognize, in the translations, names of places and persons which, would be familiar under the original, very different, and perfectly, intelligible garb.

We find even Bishop Heber, generally a better informed traveller, and more careful investigator, than many of those who preceded him, and than more who came after him, writing as follows of some of the remains he saw, and how grievously he was misinformed on this particular point will be seen by all; that he was so in several other instances, will be shown hereafter.

By means, however, of local researches of the nature previously alluded to, continued perseveringly, and with an unity of purpose that will, it is to be hoped, characterize the proceedings of our Society, we shall be enabled, in time, to prepare, from the materials in progress, a respectable "Hand Book of Dehli," in which the traveller will be furnished with more authentic accounts, than now exist, or at least are generally accessible, of the various buildings and ruins about Dehli, and which it may be desirable for him to examine if more than a mere sight-seer, so as to understand something at least of the former state of this country, and not have to wander through the mazy mass of ancient remains in almost utter ignorance of the date of their erections, the object with which they were built, the name of the founder, and the date and occasion of their destruction or decay, gazing upon them, in fact, with the undefined feelings of a child looking down into a dark passage, totally ignorant of its extent.

"In our way, one mass of ruins, larger than the rest, was pointed out

* Col. Briggs is a brilliant exception.

to us as *the** old Patan Palace. It has been a large and solid fortress, in a plain and unornamented style of architecture, and would have been picturesque, had it been in a country, where trees grow, and ivy was green,† but is here only ugly and melancholy. It is chiefly remarkable for a high *black* pillar of *cast metal*, called Feeroz Shah's walking stick. This was originally a Hindoo work, the *emblem*, I apprehend, *of Siva*, which stood in *a temple on the same spot*, and concerning which there was a tradition, like that attached to the coronation stone of the Scots, that while it stood the children of Brámá were to rule Irdraput.‡ On the conquest of the country by the Mussulmans, the vanity of the prediction was shown, and Feeroz, enclosed it *within the Court* of his palace as a trophy of the victory of Islam, over idolatry. It is covered with inscriptions, *mostly Persian and Arabic*, but that which is evidently the original, and probably contains the prophecy, is in a character now obsolete, and unknown, though apparently akin to the Nagaree."

Were the works of other travellers, before and after Heber, carefully examined, it is probable, we might find as great, if not greater, misrepresentations, and what is worse they indicated considerable amount of ignorance on the part of those living on the spot, who "pointed out" the ruins, and must have told the Bishop, what he has related above, for a personal inspection would have proved to him at least that the pillar was not an *iron* one, and that there were no Persian or Arabic characters upon it. It is particularly to be noted that such works as that of Bishop Heber are likely, on account of the apparent character for research they have obtained, to perpetuate the mistakes they make, as compilers of gazetteers and works on geography, mainly depend on books of travels for the information they condense. Hamilton, in his article "Dehli," has clearly *taken* much from Heber, though his source of information is not acknowledged.

Circumstances, which it it unnecessary to explain, have precluded the following out the more desirable plan of commencing a series of

* The italics are ours.—H. C.—H. L.

† Had Bishop Heber seen the splendid ruins at the Kootub during the rainy season he would never have made this remark.—H. C.—H. L.

‡ The tradition attaching to the iron pillar at the Kootub, altered and misapplied.—H. C. and H. L.

investigations, for fixing the exact or proximate sites of the sueeessive towns and forts around Dehli, with the precision that has become now more than ever desirable, because the ruins are rapidly passing away, and may soon not leave a vestige behind of that most important period, where historieal light begins to illumine the dimness of tradition, and we are, therefore, eompelled to defer the examination of the more aneient, and as it happens, more distant remains around us, and to enter, in the first instance, on an investigation of those which, being nearer at hand, have been more easily aeeessible, sinee the formation of Arehæological Society of Dehli, to whom these researches more espeeially appertain.

We have already enumerated, in a previous paper (vide Journal of the Asiatie Society, vol. XVI. page 577, June No. for 1847,) the great works that a long and, eomparatively, peaceful reign enabled Feeroz Togluk (or Kootloog as the name ought properly to be written) to erect as monuments of his power, of his munifieenee, and above all, of his great publie spirit. Amongst them are mentioned *two hundred* towns and twenty palaees; a number showing pretty clearly that, although the general spirit of vanity that seems to have aetuated many of his predecessors, and some of his sueeessors, was not altogether dormant in this monareh, the desire of doing good to his people predominated greatly over that of securing to himself handsome dwellings and posthumous fame. He preferred affording seeurity to his subjects within the walls of the towns he built for them himself, or which the prevalenee of peaee enabled others to build under his auspiees, to gratifying his love of display in edifices appropriated to his own particular use; and he thereby justified, in a peculiar manner, that eelebrated record of his deeds inseribed by himself on the *great Musjeed of Dehli*, possibly the one which Taimoor, is said to have admired so much as to have induced him to earry away all the masons of Dehli, to ereet a similar one at Samarkand on his return to his own capital.*

* The exact loeality of this Musjeed is a most desirable point of investigation. It is said that when Taimoor invaded India (1398) the musjeed at the Kootub was nearly, if not quite, perfect. If so *it* must have been *the* great musjeed, and by far the most magnifieent edifice in the place: but it was not built by Feeroz whose architeeture was very inferior, and it is much more likely he would select one of his own construction, on which to inscribe the record of his undoubted greatness as a liberal, munificent and mild ruler. How interesting too would be, a detailed life of this monarch, for which there

Of these two hundred towns many of which, in all probability, still exist in various parts of the country, under the several denominations of Feerozabad, Feerozpoor, Feerozghur (and possibly Feerozshuhur or Feerozshah, the name of which is immortalized by the contest on the memorable 31st of December, 1845), probably the largest, and certainly the one deserving the greatest consideration, from the Archæologist, is the town of Feerozabad, of which some remains are still in existence close outside the Dehli and Toorkman gates of the modern city: and of the reputed twenty Palaces are first, the celebrated one of which the vast ruins are still visible on the banks of the former stream of the Jumna, immediately south of the extreme point of the present town-wall, and commonly known by the name of Feeroz Shah-ka-Kotlah; and secondly, the Palace of Jehannamah, of which there are few remnants, one of them, however, most prominent, in existence on the hill N. W. of the town of Dehli, on the site of which Mr. W. Fraser, the murdered Agent and Commissioner, built a house that now belongs to

are ample materials, with illustrations of the almost innumerable works of utility he constructed not only in and around Dehli, but in every part of his extensive dominions. In the vicinity of Dehli alone there are said to be, and close investigation would probably add to the number, 25 bunds, some of them in a state of excellent preservation, which owe their existence to this benefactor of his people, and which must have made the cultivation of the land independent of well irrigation, and have removed all fear as to the cold weather crops.—H. C. and H. L.

Since the above was written we have been favoured with the following interesting note from Major E. M. Loftie, a distinguished orientalist, and member of our Society.

"It may, perhaps, be as well to mention, with reference to the supposition, regarding the *great musjid*, on which Fírúz Sháh inscribed a copy of his auto-biography and institutes, that the mosque in question was that built by him in Firuzabad—as will be found stated by Briggs, vol. 1. p. 462, who says, 'He caused his regulations to be carved on the musjid of Feerozabad.' The original of Firishta is very clear on this point, his words being 'burgoombuz i alee kidur *musjidi jamiu i* Feerozabad bina nihadu, o moo-summun ust' 'on the lofty dome (or tower) which he had constructed in the *great mosque* of Firuzabad and which is an octagon.' Nizamuddin Ahmad, the author of the Tabakát Akbarí, also confirms this. He says, in almost the same words,—'bur goombuz, alee ki din *musjid* i Feerozabad bina nihadee o moosummun ust,' 'on the lofty dome (or tower) which he had constructed in the *mosque* of Firuzabad, and which is an octagon.' From this tower or dome having had eight faces—and the work having been divided into eight books (which latter fact both Firishta and the Tabakát mention) we may with considerable probability, conclude that one boyk was inscribed on each face.—What a pity so truly interesting a building should have been destroyed! Are there no hopes of our being able to obtain a fragment even of these inscriptions?"

Maharaja Hindoo Rao. Towards identifying these two localities, (to the first of which, however, we must confine our present observations, leaving the account of the Jehannamah Palace for a future occasion,) as here laid down,* with the names they bear in contemporary and more recent histories, we have the following evidence.

In the first place it is stated in the Zuffernama of Alee Yezd, an almost contemporary author, whom we have had the good fortune to consult in the original, that Feerozabad was situate opposite the embouchure of the canal brought by Feeroz from the Kalee Nuddee into the Jumna, and that embouchure corresponds exactly with that of the present Doab Canal which is, as near as possible, opposite the present ruins. In the second place it is stated, that Feerozabad was distant three miles from Dehli, and three miles from Jehannamah, which, allowing that the site beyond Gheiaspoor was old Dehli, and that we have correctly identified the site of Jehannamah, corresponds as near as can be, allowing an oriental latitude for distances, with the present position. In the third place we have it recorded that Feeroz Shah brought a branch of his canal to Feerozabad, and there is at the present day a branch, choked up, leading from the main stream into the centre of the site we have fixed upon; and lastly, were any further evidence required, and perhaps the most convincing proof of all, is the fact that the name of Feerozabad is still in existence, and applied to the spot on which the Kotla, &c. are situate. There is no actual village, and the Zumeendars of the lands that bear that name, live in the town of Dehli, but they pay rent under that name, and this circumstance most satisfactorily completes the chain of local evidence. The name is erroneously laid down in the district map of the Sudder Board of Revenue, as Feerozpoor. Let us now proceed to a short historical sketch of the place.

It is rather singular that the only mention made of the town in Ferishta's history of the life of Feeroz Togluk, (we are in hopes, however, of being able to secure more authentic materials in the history of Zeca-ood-deen Bunu, and the Shums-sceraj-Ufeef Feerozshahee, promised us, and which may be available in our description of the locali-

* With all due deference the high authority, under which the Revenue map of the district of Dehli made its appearance, that of Mr. H. M. Elliot, then Secretary to the Board of Revenue, we think that the position of Jehannamah is erroneously indicated in that map, where it is placed, viz:—half a mile or more to the right of the canal, or nearly on the spot occupied by the new Edgah.—H. C. and H. L.

ties) is that it was built in the year of the Hijra 755, corresponding with the year of our Lord 1354, or in the 3d year of that sovereign's reign, and that it adjoined (comparatively speaking) the city of Dehli, (the old city, the Gheiaspoor above indicated?) It is probable that up to that time, he occupied one of the Palaces in Dehli-proper, or at least during the periods of his residence at the capital, as it is stated that on the 2d of Rujub, A. H. 752, he entered Dehli, and there ascended the throne, and that his second son Mahomed, who ultimately succeeded him, was born in that town. This solitary allusion to Feerozabad, and the precise date of its foundation therein given, are, however, of material consequence. We have in the Kalán Musjeed, the date of the completion of which has been accurately verified,* an excellent specimen of the architecture of those days, a fact of great importance, as the style of almost every monarch, who had sufficient time to devote to the building of towns or palaces or tombs, is marked in the most striking manner. The materials, the plaster both within the walls and on the outside, the conformation of the domes, the slope of the entrance into the chief apartment, the battlements around the same, the stair cases, the brackets, the eaves, and above all, the massiveness

* Vide Asiatic Journal, as above quoted. We have, since the publication of that description of the Kalán Musjeed, been favoured with the following memorandum regarding the translation of the inscription from that distinguished Orientalist, Mr. H. M. Elliot, in the correctness of which we entirely concur, after a careful examination of the original:—

"Allow me to point out an error into which, I think, you have fallen in your translation of the inscription on the Kalán Musjeed. If on further consideration you and Lieut. Lewis concur with me, you should keep a record of it, as it will be useful, perhaps, on reading other monuments of that period; you have translated "*Mugbool ool Mukhateb*," 'exalted with the title.' Now this conjunction of the two words is not good Arabic, and I look upon it that *Mugbool* is part of Jonah Shah's name:—'Junah Shah Mugbool, entitled Khan Jehan.' The name was very common at that period, and his father's name also is given by some authors as Mulik Mugbool, and by others as Mulik Kubool. Ferishta, in one part, calls the father Mugbil. At all events there seems enough to show that the son's name was Mukbool, and should be so read in the inscription. Junah Shah was no doubt the name given by the obsequious father, in compliment to Mahomed Togluk, whose name was Jouah Shah, after whom Jonpoor was so named by his nephew Feeroz? We may add, as a 'contribution' to the biography of Khan Jehan the elder, that he is mentioned in Ferishta as the son of Rookun-ood-deen, of Thanesur; but whether the word Thanesuree means that he and his family were of Thauesur, or that he possessed that place in Jagheer only we cannot say. He is certainly spoken of as one of the most disreputable fellows of the time.—H. C.—H. L.

and general character, correspond so entirely, allowing for the difference of the edifices, one a Palace the other a Mosque, that there can be no mistake in ascribing both edifices to the same era, besides which the several buildings that elsewhere mark the site of Feerozabad, and which will be mentioned hereafter, all bear evident signs of having been erected about the same period as the Kalán Musjeed. Although Feerozabad is not again expressly mentioned by the historian we have quoted during the life of its founder, it is reasonable to suppose, it continued a place of importance during his life and perhaps his place of ordinary residence. On the death of Feeroz in A. H. 790, (A. D. 1388,) Geias-ood-deen Togluk, his grandson (by the favorite and eldest, but deceased, son Jutteh Khan) is particularly stated to have ascended the throne in the Palace of Feerozabad, a fact which would go far to establish the correctness of the inference, that his own and of course favorite town was the usual residence of Feeroz. Gheias-ood-deen was succeeded by a cousin named Aboo-Bukr. This prince was, after a short reign of one year and six months, made prisoner, and superseded by his uncle Nusseer-ood-deen, who first took possession of the Palace of Juhannamah, Aboo Bukr being "in the opposite quarter of the city called Feerozabad" (which supposing him to have been in the Palace of that town would be a correct expression with regard to the relative position of the royal residences of Juhannamá and the Kotla, as Feerozabad appears to have stretched in a N. W. direction towards the former. On the 18th of April 1389, (2d Jumahool-awul 789 A. H.) a battle took place in the very streets of Feerozabad, in which 50,000 men were engaged under Nusseer-ood-deen, a fact that speaks convincingly as to the great extent of ground it must have covered. It may also lead to the inference, that the town was very imperfectly protected by outer walls; if they had been of any great strength or size, some trace of them would surely be visible, but there is not one stone upon the other, west of the Palace, that could be pronounced the debris of a wall likely to have been the town-wall of Feerozabad. Nusseer-ood-deen was defeated with the assistance of Bahádur Kadeer, a Mewatee chief, who seems to have held the scales in which several sovereigns were weighed, and found wanting if he did not side with them. He came to the aid of Aboo Bukr, with a strong re-inforcement. On the following day, the king in possession,

marched out of Feerozabad, and drove Nusseer-ood-deen with great slaughter, quite out of Dehli. Another engagement soon after took place in Dehli, but which part it is difficult to ascertain from the context. After this engagement, Aboo Bukr, hearing of treason in his household, fled to his Mewatee friend, leaving Nusseer-ood-deen, to take quiet possession of "Dehli and its Palace." He shortly after pursued the ex-King into Meerut, there took him prisoner, and confined him in Meerut. It is added that he died there some years after, but we may safely infer, that he obtained a conditional degree of liberty, as tradition ascribes to him, the excavation which divides Meerut, at the present day, into the black and white town. That he died a man of some consideration is evident from his tomb still standing in a state of considerable preservation west of, and close to, the jail at Meerut. Nusseer-ood-deen himself seems, subsequently, to have resided chiefly in the town and fort of Mahomedabad, built by his father's predecessor (his grand uncle) Mahomed Togluk, and died there.

The son of Nusseer-ood-deen reigned only 45 days, and the nobles who had, by this time, become all-powerful, raised the younger son of Nusseer-ood-deen to the throne. His name was Mahmood Togluk, and in the accounts of his disastrous reign, we find more frequent mention of Feerozabad than at any previous period, and we may infer that it was again in his time, a place of almost as great importance as Dehli itself. The head of a faction, formed at the very commencement of the reign of Mahmood, named Saadut Khan, having defeated the king's party headed by Mookurreeb Khan (Vakeel-oos-Sultanut, and Ameer-ool-omra) outside of Dehli, would have besieged him in that place, but the rains having set in, he was unable to keep the field, struck his tents, and marched into Feerozabad. He called in a grand son of Feeroz Togluk, named Noosrut Khan, with the view of setting him up against Mahmood, but some household troops, who had hitherto sided with Saadut Khan, seized this Prince, placed him on an elephant, and having advanced against Saadut Khan, expelled him from the city of Feerozabad.

"The misfortunes of the state," says Ferishta,* "daily increased. The owners of Feerozabad, and some of the provinces, espoused the cause of Noosrut Shah. Those of Dehli, and other places, supported the title of Mahmood Togluk. The government fell into anarchy; civil

* Brigg's Translation.

war raged every where; and a scene was exhibited unheard of before, of two kings in arms against each other, residing in the same capital. Tartar Khan, the son of Guffur Khan of Guzerat, and Fuz-oolla Bulkhee, entitled Kootloogh Khan, joined the prince Noosrut at Feerozabad. Mookurrib Khan and other chiefs espoused the cause of Mahmood Togluk, (in Dehli it is presumed,) while Bahádur Naheer, and Mulloo Yekbal Khan, with a strong body of troops occupied the fort of Seeree, and remained neuter, but were prepared to join either party according to circumstances. Affairs remained in this state for three years with astonishing equality; for if one monarch's party had, at any time, the superiority, the balance was soon restored by the neutral chiefs." Here again we have inferential proof, that although not so large as Dehli, and perhaps not so strongly fortified, Feerozabad, or at least its palace, must have been a place of strength and importance to be able to hold out so long against Mahmood Togluk and his party.

Shortly after the above extract we find the following in Ferishta: "In Dehli, Mulloo Yekbal Khan, having disagreed with Mookurrib Khan, abandoned the cause of Mahmood Togluk, (in Dehli) and sent a message to Noosrut Shah (in Feerozabad) offering to join his party. This proposal was readily accepted; the parties met and went to the palace of Seeree" (so that Bahadur Naheer, the Mewatee, must either have been previously expelled, or have joined this party, which is more probable) "where they swore mutual friendship on the Koran at the tomb of Khwaja Kootab-ood-deen Bukhteear Kakee." (The mention of this fact is most important as it is almost the only allusion, in Ferishta at least, on which to ground a certain inference as to the exact position of Seeree.) "A quarrel now took place between Mahmood Togluk and Mookurrib Khan; and about three days after, another rupture occurred between Mulloo Yekbal Khan, and Noosrut Shah, when the former, regardless of his oath, formed a conspiracy to seize the latter. Noosrut Shah informed of the plot, thought it advisable to quit the palace of Seeree, and Mulloo Yekbal Khan, intercepting his followers in his retreat, took all his elephants, treasure and baggage; while the unfortunate Prince, being in no condition to keep the field, fled to his vizier, Tartar Khan, at Puneepnt. Mulloo Yekbal Khan, having obtained possession of Feerozabad, increased his power, and strove to expel the king Mahmood, and his partisan Mookurrib

Khan, from the "old city." At length, by the mediation of some nobles, peace was concluded between the parties; but Mulloo Yekbal Khan, perfidious as he was, and regardless of the sacred oaths of the treaty, attacked Mookurrib Khan in his own house, and slew him. He also seized Mahmood Togluk and deprived him of all but the name of king."

The next mention we have of Feerozabad, is on the occasion of the invasion of Taimoor, which occurred very shortly after the events detailed above. On the 13th January 1398, (5th of Jummadi-ool-awal A. H. 801,*) this scourge of the human race, after putting to death so large a number of prisoners on the plain beyond (east of) Louse, as must have deluged the land with blood, forced the river without opposition, and encamped "on the plain of Feerozabad." This plain was, in all probability, either the land now occupied by Jaisinghpoora, and further south, towards the tomb of Munsoor Alee Khan (Sufdur Jung) or the spot now occupied by modern Dehli. While Dehli became the prey of the ferocious army which he commanded, Feerozabad seems to have escaped the fury of those madmen, for we learn that on Taimoor finally quitting Dehli after revelling for 15 days in blood, and rapine, he marched three miles to Feerozabad (an important fact for hereafter fixing, with tolerable exactitude the position of "Dehli or old Dehli," and which supports our previous inference, that the Dehli of those times was just beyond Indraput) and having encamped there, offered up his prayers in the large mosque, which is said by the historian to have been on the banks of the Jumna; but for this assertion, we might suppose, it was the Kalán Musjeed which was alluded to.

Ten years after Taimoor's invasion we find Mahmood Togluk, still nominal king, defending himself in Feerozabad successfully against his ultimate successor Saiud Khizr Khan, in consequence of the enemy suffering from a scarcity of forage and grain.

Three years after Khizr Khan returned to the assault, on which occasion Mahmood shut himself up in the old citadel of Secree, while Yektecar Khan, who commanded in Feerozabad, seeing the desperate condition of the king's affairs, joined Khizr Khan, and admitted him into the fort (Feerozabad), notwithstanding which Mahmood made a

* There appears an error of 17 days in the abbreviated translation of the Zuffurnama, by P. dela Croix, but we cannot speak with certainly without a more close investigation. Should this prove to be the case as we suspect it will, or the 13th January 1398, as above, we should read 27th December 1397.—H. C.—H. L.

successful defence of Secree. He died the following year near Kaithul, (Feb. 1412.) An Afghan chief, of the name of Dowlut Khan Lodee, reigned after him nominally for one year and three months, when Khizr Khan, finally succeeded in obtaining possession of the throne,* and in establishing a new dynasty. From this time (1416) or 62 years after it was founded, it is most likely that Feerozabad began to decline. The building of Mobarikabad in 1435, showed that it was no longer thought a suitable residence for kings of another race, and while the construction, in 1533, by Humaioon of a new fort, and the foundation by Shere Shah, almost immediately after, of a new and distinct town, part of which must have been built on a portion of the site of Feerozabad, showed that as a town of any consequence it had almost entirely disappeared, the materials being, as usual, in all probability, carried away to construct more recent edifices. This is the more likely, as Sekunder Lodee had, for some years before his death, made Agra his principal place of residence.

From the foregoing outline of its history, and from the tolerably accurate indications we have of its locality, taking also the style of the remains of the palace, and other buildings into consideration, and bearing in mind that we have the date of the Kalán Musjeed† to bear out what we have advanced, we consider that there can be no hesitation in laying it down as a fact, that the ruins of the Kotla, as they now stand, are the remains of the palace built by Feeroz Togluk, and that the city of Feerozabad, also built by him, extended a considerable distance to the south-west, but mostly to the north-west of the palace, where there are still numerous debris of old buildings, besides several tombs and mosques, more or less perfect, all bearing the most distinct marks of that period; the Kalán Musjeed being one of them. We shall endeavour, in our next paper, to trace even more exactly the limits of Feerozabad, and to give a short account of the several buildings alluded to, accompanied, if possible, by plans and sketches of the most remarkable of those edifices, with a general plan of the whole supposed site and neighbourhood.

* Khizr Khan though sovereign *de facto*, never openly assumed the title of King, but was contented to rule as the representative of Shahrookh, the son and successor of Taimoor, on whose name the Khootba was read.—H. C.—H. L.

† It seems likely that this Musjeed was erected by Khan Jehan, Wuzeer with the object of securing the good will of the people of the capital on his contemplated usurpation of the throne of his master, then verging rapidly to a state of mental imbecility.—H. C. —H. L.

# PROCEEDINGS

OF THE

# ASIATIC SOCIETY OF BENGAL,

For August, 1847.

The usual monthly meeting of the Asiatic Society was held, on the evening of Wednesday, the 4th of August.

The Right Rev. the Lord Bishop, in the chair.

The proceedings of the previous meeting having been read, and the accounts and vouchers presented—the following gentlemen were balloted for and duly elected members of the Society.

J. Beckwith, Esq., Calcutta, Wm. Greenway, Esq., Assay Master, Agra, and Capt. J. D. Cunningham, Bhopal.

The names of the following gentlemen were submitted, as candidates, for election at the September meeting.

Dr. Lamb, Surgeon General, proposed by Lieut. Staples, seconded by J. W. Laidlay, Esq.

Gilson R. French, Esq., proposed by Mr. Laidlay, seconded by Dr. O'Shaughnessy.

Wm. McDougal, Esq., proposed by Mr. Laidlay, seconded by Dr. O'Shaughnessy.

Read letters from the Secretary to the Military Board, forwarding copies of the Water-guage Register Report for 1845 and 1846, for the Ganges and Jumna rivers.

From H. M. Elliot, Esq., Secretary to the Government of India, Foreign Department, announcing that a British mission was about to proceed to Thibet and inviting the suggestions of the Society regarding all matters of scientific or literary interest the Society might desire to have investigated by the Commissioners.

A communication on this subject, from the Council of the Society, will be found in the sequel of the evening's proceedings.

From the Rev. Dr. Hæberlin, forwarding 100 copies of his revised edition of his Sanscrit Anthology, regarding which a favorable report was presented at the same time from the Secretary in the Oriental Department.

Referred to Oriental Section for advice as to distribution of the copies.

From Capt. Wm. Munro, communicating his report drawn up at the instance and on the part of the Society, on the timber trees of Bengal.

Referred to the Committee of Papers, and the marked thanks of the meeting presented to Capt. Munro, for his valuable co-operation.

From the Rev. Mr. Wenger, presenting his "Introduction to the Bengálí language" and requesting to be favored with a copy of Westergaard's "Radices Linguæ Sanscritæ." Copy voted with the thanks of the Society.

From Lieut. R. Strachey, Almorah, dated 9th July, forwarding an account of the Glaciers of the snowy range about 7 marches from Almorah—and offering to present to the Society a small collection of minerals brought by his brother from Thibet.

Lieut. Strachey's paper has been published in the Journal for August, and his offer of the specimens accepted with thanks.

From Capt. J. D. Cunningham, giving a narrative of his antiquarian researches in the Bhopal district.

From B. H. Hodgson, Esq., of Darjeeling, presenting papers with plates on the Cat-toed sub-plantigrades of the Himalayas, and on a new species of Plecotus.

From Dr. McGowan, Ningpo, dated Sept. 1846, presenting a curious work, entitled a Chinese Vocabulary and Dialogues, &c.—by P. Strenenassa Pillay, Chusan, 1846.

*Ningpo, Sept.* 1,1846.

*To the Secretary of the Asiatic Society of Bengal.*

Dear Sir,—I have the pleasure of forwarding, at the request of the author' the accompanying volume entitled "A Manual for Youth and Students, or Chinese Vocabulary and Dialogues, containing an easy Introduction to the Chinese Language, Ningpo Dialect. Compiled and translated into English by P. Strenenassa Pillay—Chusan, 1846."

The book is a philological curiosity and interesting to the friends of oriental literature, as the product of an Indian mind. During his residence

at Chusan as "Head Conicopolly" to H. M. Commissariat from 1842 to 1846, he succeeded in mastering the colloquial dialect, and at his own expense published his Vocabulary, for the benefit of future students.

As the author was unable to read Chinese, and his knowledge of English being far from perfect, the volume abounds in errors. Nevertheless he deserves praise and encouragement for the literary zeal, which prompted him to execute the work. Each square is denoted to the definition of an English word. The first column from the left attempts to give the English sound in Chinese characters. The second is the English, next comes the Chinese definition, and lastly the sound of the Chinese in Tamil and Teloogoo characters. The book, therefore, is designed for the use of English, Chinese and Indian Students. It may be observed, however, that this attempt, like all others that have been made to imitate English sounds by Chinese characters, is a failure. For example—for "*White* hair" we have "*Wé lih hai 'rh*" "*Spring, Se puh ling,*" Lose, *lo ho sze*, Present, *pa lih tsun teh*, Slumber—*se lung pa 'rh.*"

Commending S. Pillay to those who would foster native talent.

I remain, dear Sir,

Very truly, your's

D. J. McGowan.

From Capt. Scott, Secretary Military Board, presenting a parcel of cotton cloth impregnated with oil, which had undergone spontaneous combustion.

A full account of several experiments made on this very important subject, will appear in an early number of the Journal.

From Capt. Jas. Abbott, Huzaree, forwarding mineralogical specimens and describing the geological features of the district he is now surveying.

From Capt. Alexander Cunningham regarding the *Serica* of the Periplus. Pending a more detailed memoir on this subject, we may mention that Capt. Cunningham differs from Dr. Taylor in his identification of Serica with Assam, and considers two points sufficient to prove that Serica was the country about Yarkand, Khoten, and Beshbalik at the foot of the Altai. Capt. Cunningham observes, "The first of these is, that the road leading to Serica lay over the Komedan mountains, *at the Source of the Oxus.* This name still existed in A. D. 640, when Hwan Thsang visited India, for he mentions Kiumi-tho on the northern bank of the Oxus, along with *Pho-mi-lo*, or Pamer, and *Po-lu-lo*, or

Bolor. The second point is that the Essedones (*magna gens*, as Ptolemy calls them) derive their name from the gallic word *esseda*, a chariot, or wagon. Now the people of the country around Beshbalik were called by the Chinese *Kiotshang*, or wagoners, from *Kiotshe*, a high-wheeled wagon (quære the origin of *coach?*) These people call themselves Ouigours, who are the Ουιγουροί of the time of the emperor Justin, and the Ιθαγουροι or Ηταγουρι of Ptolemy; which two readings we may safely change to Ουιγουροι, the Ouigours, who,—as their Chinese appellation of Kiotshang, wagoners, intimates—were the same as the Essedones. The Sera metropolis must have been Beshbalik, the capital of the Ouigours. The Psitaras river of Pliny must be simply the Su-tarini or the river Tarini, that is the united streams of the Kashgar, Yarkand, and Khoten rivers. As an illustration of this view I will only cite the position (to the Southward) of ΑΔΙΣΑΓΑ (read ΑΛΙΣΑΓΑ) which must be Alsaug, or Lassa. The Dabasæ, and the Damasæ mountains must have some connexion possibly with the Larmas, but more probably with the name of Lassa itself—and the river Daona must be the Dihong, a proof that so far back as the time of Ptolemy the river (*Sán-pu*) which flowed past Lassa was the head of the Brahmaputra, or Dihong."

On the part of the Council of the Society, the Senior Secretary stated that on receipt of Mr. Elliott's letter, announcing the departure of a British mission to Thibet, the Council immediately issued instructions to their Curators and Librarian, and invited the several sections to co-operate with them, in preparing lists of scientific desiderata, which the mission might be enabled to supply. They also appointed Messrs. Hodgson, Campbell and Waugh, all resident at Darjeeling, a corresponding sub-Committee of the Society for this special object.

The Council have much pleasure in stating, that so promptly did the sections and officers of the Society comply with their requisition, that on the tenth day from the receipt of Mr. Elliott's letter, copious documents containing many valuable suggestions were forwarded to the mission, with a set of Ritter and Mahlman's maps. Mr. Frith, a member of the Council, having volunteered to accompany the mission as Naturalist, at his own expense, the Council forwarded his offer, with their cordial support, to the Hon'ble the Deputy Governor, who was pleased to declare his readiness to accept it, but expressed much doubt whether Mr. Frith could then overtake the mission.

A favorable report was received from Mr. Welby Jackson, on the MS Catalogue of Curiosities in the Museum, prepared by the Librarian.

Reports were received from the Curators, in the Geological and Zoological Departments, and the following list of Books received during the previous month was submitted by the Librarian.

*Books received for the Meeting of the 4th August, 1847.*

PRESENTED.

Le Moniteur des Indes Orientales et Occidentales, Vol. II. part I.—By THE EDITORS.

The Quarterly Journal of the Geological Society, No. 10.—By THE SOCIETY.

The Oriental Christian Spectator for July, 1847.—By THE EDITOR.

The Journal of the Royal Asiatic Society, No. XVII. part 2.—By THE SOCIETY.

Meteorological Register, kept at the Surveyor General's Office, Calcutta, for the Month of July, 1847.—By THE OFFICIATING DEPUTY SURVEYOR GENERAL.

The Oriental Baptist, Nos. 6—8.—By THE EDITOR.

Upadeshaka, (a Bengálí periodical.) Nos. 6—8.—By THE EDITOR.

EXCHANGED.

The London, Edinburgh, and Dublin Philosophical Magazine, No. 202.

The Athenæum, Nos. 1021-2.

PURCHASED.

The Edinburgh Review, Nos. 168-9.

The North British Review, No. XIII.

Histoire Naturelle des Poissons, par M. Le Bon Cuvier, et M. A. Valenciennes, Tome dix-neuviéme.

Voyage Dans L'Inde, par Victor Jacquemont, pendant les Années 1828 á 1832, in 4 vols. 4to.

As the meeting was about to separate *Major Marshall* handed in the following notice of a motion which he signified his intention to bring forward at the September meeting.

*Notice of Motion for next meeting of Asiatic Society.*

Each Section, Committee and sub-Committee of the Society shall be authorized to elect its own Secretary.

G. Marshall.

*August 4th*, 1847.

The above notice having been duly recorded, and thanks voted for all donations to the Library and Museum, the meeting adjourned to Wednesday the 1st of September.

*Report of Curator, Zoological Department.*

The only donations I have to acknowledge on the occasion of the present meeting, are as follow :—

1. From H. Alexander, Esq. C. S. A very fine and perfect skin of the *Ursus isabellinus*, Horsfield, v. *syriacus*, Hemprich and Ehrenberg. Of several skins received, at various times, of this chiefly trans-Himalayan Bear, the present specimen is the first that could be properly mounted as a stuffed specimen.

2. From R. W. G. Frith, Esq. A full grown specimen of the 'Tokke' Lizard of the Tenasserim provinces, *Platydactylus gecko*, (Lin.)

3. From E. Lindstedt, Esq. A large specimen of *Dipsas trigonatus*, Schneider, procured in the neighbourhood.

E. Blyth.

*August 4th*, 1847.

*Supplementary Report.*

The group selected for exhibition this evening is that of the *Bucerotidæ*, or Hornbills, with certain genera allied to them : and I have the pleasure to call attention to a particularly fine series of these remarkable birds. The following are the species now mounted in the Society's Museum ; which I shall endeavour, as far as appears practicable, to arrange into minor groups.

Firstly, a conspicuous series presents itself of species, amongst which the casque attains its maximum of development ; being in particular well elevated posteriorly, where it rises abruptly from the forehead, and generally protrudes backward over it (instead of rising and gradually sloping forward from the middle of the forehead, as in various other species). The sexes resemble each other, black and white—save in one remarkable exception—being the only colours of the plumage : and the medial portion of the throat (more or less broad) is well clad with feathers.

At the head of this series range two remarkable species, both for size and for the peculiar form of the casque, which is altogether different in the two :

but they resemble, and differ from all the rest, in having a white tail crossed by a black band, occupying its subterminal fourth or fifth; and the first species alone has a white wing-band, and the white of its occiput and neck is strongly tinged with fulvous.

1. *B. cavatus*, Shaw, Vieillot: *B. homrai*, Hodgson, *As. Res.* XVIII, pt. II, 169 *et seq.*, with coloured figure and views of the casque at different ages: probably *B. bicornis*, Lin., in which case its range of distribution would extend to the Philippines. Adult male and female, and skeleton of a female, from Arracan; presented by Capt. Phayre: and large head of an Assamese specimen, that was presented by Dr. McCosh. This great species inhabits the more extensive hill forests of all India, but would seem to be considerably more numerous, and also much easier to procure, along the whole eastern coast of the Bay of Bengal, from the Straits of Malacca northward to Sylhet and Assam. The female is rather smaller than the male, and (as also in *B. rhinoceros* and *B. pica)* may be readily distinguished by having the hindmost portion of the casque pale, instead of black.

2. *B. rhinoceros*, Lin.: and the young, probably *B. niger*, Shaw (nec Vieillot), *B. sylvestris*, Vieillot, and *B. diadematus*, Drapiez. Very fine adult male, and young; presented by the Rev. F. T. Lindstedt: and adult female, presented by the Rev. J. Boaz: all from Malacca. Inhabits the Malayan peninsula and archipelago. The sexual differences are pointed out in XIV, 188.

Next may be introduced the species before referred to, as constituting an exception to the general coloration of the others of this group. Its upper parts are of a dusky greyish-brown, rather than black; the head, neck, and thighs are deep ferruginous; the lower-parts and facial mask (as in *B. cavatus)* are alone black; and the tail is fulvous-white, as are often the exterior wing-feathers, to a greater or less extent (even on the two wings of the same bird): but the casque is broad and flat posteriorly, protruding far backward over the forehead; and the nearest affinity appears to be with *B. cavatus*, of which some authors have even considered it the young.

3. *B. hydrocorax*, Lin.: *B. bicornis*, var., Shaw; *B. cristatus*, Vieillot; *B. platyrhynchus*, Pearson, X, 652. Specimen described in XII, 988. This, with the specimen of *B. panayensis*, was presented with the Macao collection by R. Inglis, Esq., as noticed in V, 249: both species inhabit the Moluccas.

The next three are very closely allied. Colour black, with white abdomen and wing-tips, and all or part of the four outer tail-feathers on each side: the casque high, simple, well projected backward over the forehead, compressed and pointed to the front, where it advances at a more or less acute angle with the ridge of the upper mandible.

4. *B. pica*, Scopoli: *B. malabaricus*, var. B, Latham; *B. monoceros*, and probably *B. violaceous*, Shaw: *Bægma Dunnase*, White, *As. Res.* IV, 119:

described in XII, 993 *et seq.* Casque large, much compressed, with a great black mark occupying the larger portion of its ridge and sides in adults, but never descending upon the upper mandible: the three outer tail-feathers white, and the fourth either partially or completely so. Inhabits the Indian peninsula generally, even to Cuttack. Adult male and female, from Chyebassa; presented by Capt. Tickell: another adult male, from Goomsoor; presented by Capt. McPherson: and another old female, with nearly half of the upper mandible broken away, but the casque uninjured; from Cuttack, presented by Dr. Gurney Turner of Midnapore. The last was shot with its upper mandible thus broken, and the edges of the fracture worn away, as it now appears in the stuffed specimen.

5. *B. albirostris,* Shaw, Vieillot: *B. malabaricus,* Latham; *B. leucogaster,* nobis, X, 922 (the young): described in XII, 995. Differs from the last in its inferior size; in having only the terminal portion of all but its middle tail-feathers white; and in the casque being much wider (as if inflated), with the black mark greatly reduced, occupying the tip only of its ridge, but invariably extending downward upon the upper mandible. In the female, this black mark is less defined, often occupies as much as half of the ridge of the casque, and extends even to occupy the tip of the upper mandible; while the cutting edges of both mandibles are also black. This species inhabits Bengal, Nepal, the sub-Himalayan region further west, also Assam, Sylhet, Arracan, and the Tenasserim provinces; but not Southern India, whence the name first bestowed by Latham is inadmissible. I observed it to be tolerably common in the jungles of the Midnapore district. Six specimens retained: two from Bengal; two from Arracan, presented by Capts. Phayre and Abbott; and two from Tenasserim, presented by the Rev. J. Barbe; also a head with unusually large bill and casque, which may perhaps, however, belong to the following species.

6. *B. intermedius,* nobis: *B. violaceus* of Wagler, apud Lord Arthur Hay, *Madr. Journ.* XIII, 148: probably *B. malabaricus* of Sumatra, apud Raffles: vide p. 10 ante. Resembles the last, but with the wholly white outer tail-feathers of *B. pica.* Inhabits the Malayan peninsula, where very common about the latitude of Penang, and in Prince of Wales' Island; but I have never seen it in collections made at Malacca. A young specimen, presented (with a Penang collection) by Dr. A. Campbell of Darjeeling.

The next is nearly allied to the two last, but has no white on the belly and tips of the wings, but only on the terminal third of its four outer tail-feathers on each side: the presumed male, however, has a white superciliary coronal circle, which is represented by obscure silvery-greyish in the other sex. Bill and casque wholly yellowish-white, except at the extreme base of the mandibles and on the hindmost portion of the casque, where the colour is black.

7. *B. malayanus*, Raffles: *B. bicolor*, Eyton; *B. Ellioti*, A. Hay, who describes the young as that of the next species, *Madr. Journ.* XIII, 152: probably *B. albirostris* of Java, apud Horsfield:* females (?) described in XII, 995. Common in the Malayan peninsula. Two females (?), from Malacca; presented by the Rev. F. J. Lindstedt: another, presented by J. Middleton, Esq.

In the following series of species, the casque is often wanting altogether, or merely indicated; and when present is generally very low, and slopes forward with a gradual curve from the middle of the forehead, where its hindmost portion is (more or less completely) concealed by the plumage. The two next alone (of all the species before me) exhibit some tendency in the casque to protrude a little backward, in old and fine specimens only; but even then the bulge is hidden by the feathers of the forehead.

8. *B. nigrirostris*, nobis: adults described as those of the preceding species by Lord Arthur Hay, *Madr. Journ.* XIII, 151. Plumage exactly as in *B. malayanus*, except that the outer tail-feathers are not so deeply white-tipped (viz. 2½ in., instead of 3½ to 4 in.); and the size also is inferior, the wing barely exceeding 11 in., instead of being from 12 to 13 in.: the young further differ in having the white tips to the outer tail-feathers spotted over with black. The bill and casque are black in adults, in the young white: and the form of the casque refers this species to the present series of Hornbills; it being low, thinly compressed towards the front, and abruptly truncate anteriorly; with a longitudinal ridge on each side in old birds, occasioning a broad shallow groove above and another below it. As the beak of Raffles's *malayanus*, when "surmounted by a moderate-sized crest, which sloped gradually in front to the curvature of the bill," is described as "yellowish-white," I conclude that his specimen was a young male of the preceding species, rather than of the present one, which I suspect would show much black on the bill when the casque was so far developed. Both species inhabit the Malayan peninsula: and at present we have only a specimen of the young of *B. nigrirostris*, from Malacca; presented by R. W. G. Frith, Esq.

9. *B. birostris*, Scopoli: *B. ginginianus*, Shaw: *Putteal Dunnase*, White, *As. Res.* IV, 121. Size small: colour grey, with a white abdomen and ill-defined whitish supercilium; the tail-feathers having a black subterminal band, and white tips, the latter less developed on the middle pair; great alars also blackish, with white tips. Throat well clad with feathers. Casque low and compressed, following the curve of the bill, with the extremity of its ridge prolonged acutely forward in old birds. Inhabits India generally, but I have never seen it from the countries eastward (not even from Assam). In the Midnapore jungles, I observed it constantly in pairs; instead of in

* The name *albirostris*, indeed, applies much better to this species.

small flocks like *B. albirostris*, and I believe the members generally of the section with which we commenced. Whether others of the present series live also in pairs is worthy of observation. We have specimens of male, female, and young, from Chyebassa; presented by Capt. Tickell.

The next has no casque, but merely a sharp edge to the upper mandible, which is broad at base with an obtuse angle on each side. In XIII, 394, I remarked its affinity for the African *B. limbatus* and *B. flavirostris* of Ruppell; but have not now the opportunity of consulting that author's publications.

10. *B. gingalensis*, Shaw: *B. bengalensis*, Gray. Size small: colour dusky-grey, paler and tinged with rufous below, especially on the under tail-coverts: a slight whitish supercilium: wing-feathers narrowly edged with pale fulvous: the primaries and all but the middle tail-feathers white-tipped. Bill amber-yellow. Throat feathered along the median line only. Inhabits Malabar and Ceylon. Specimen from Ceylon, presented by Lord Arthur Hay.

The next has a low keel-shaped ridge, sloping off to the front; but is nevertheless somewhat allied to the last. Its throat is naked, or in the young merely shows two single rows of ill developed feathers along the middle.

11. *B. carinatus*, nobis, XV, 187. Size moderate, or that of *B. pica*. Colour green-glossed black, with the basal two-thirds of the tail drab-coloured, the wing-feathers slightly margined paler: head fully crested. Bill black, in the one sex, which seems always to have the abdominal region pale; in the other, yellowish-white, with black along the summit of the casque nearly to the end, and also occupying the basal two-thirds of the lower mandible, and the tomiæ of the upper one. A young specimen is quite similar to the adults in plumage, but has no trace of casque, and the bill is nigrescent with a whitish ridge and tip. Inhabits the Malayan peninsula; and the pair set up were procured at Malacca, and presented by the Rev. F. J. Lindstedt: another pair, presented by Mr. E. Lindstedt, is preserved for the Hon'ble Company's museum; and I have seen several others.

That which next follows has but a low slight casque, continued (as usual) along the basal two-thirds of the upper mandible, and then sloping off to the front; but is very remarkable for the great development of the feathers that impend the nostrils, which have stiff hair-like disunited webs, and reach forward beyond the truncated extremity of the casque; the frontal feathers being also moderately long and erect, and the whole, with the lengthened occipital plumes, forming a showy ornament.

12. *B. comatus*, Raffles: *B. lugubris*, Begbie, vide *Ann. Mag. N. H.* 1846 p. 405: adult male described by Lord Arthur Hay, *Madr. Journ.* XIII, 149 In this species, the males have the finely plumed head, neck, breast, abdomen

1. BUCEROS *nipalensis*. Hodgson, *p. 997*

2. B. *comatus*, *Raffles*, *p. 996*

tail, and wing-tips, pure white; the remainder black, a little tinged with brown upon the back: whereas the females have the neck, breast, and abdomen, also black. Raffles described the young male only, with "back, wings and tail, of a dark brown; the belly of the same colour, mixed with white; and the wing and tail-feathers all tipped with white at their points." The Society's female has a small black patch on its outermost tail-feather. Size rather large, intermediate to *B. pica* and *B. rhinoceros*, with proportionally long and broad cuneated tail. Colour of the beak and casque dusky, the former laterally whitish towards its base. Throat moderately well feathered. Inhabits the Malayan peninsula and Sumatra. Adult male and female, from Malacca; presented by Mr. E. Lindstedt.

13. *B. exarhætus*, Reinwardt. Size small; the tail but little graduated: throat but partially feathered. Colour wholly black, glossed on the upper-parts with green: the bill and casque pale, with three deep longitudinal channels or furrows. Inhabits the Moluccas. Specimen presented by the Batavian Society.

14. *B. panayensis*, Scopoli. This is an anomalous-looking little species; and the Society's only specimen accords with Sonnerat's figure, assigned by him as that of the female bird, whereas, from analogy, I think it is more likely to represent the male; but it differs from that figure in having the throat as well as the cheeks black, (as in *B. cavatus* and *B. hydrocorax*,) and in the tail being black at the base as well as tip, with a fulvous-white cross band occupying its subterminal fourth. *Au reste*, the crown, neck, and under-parts are fulvescent-white, and the upper-parts brown-black, with slight pale margins to the primaries. Casque simple, smooth, compressed and truncate to the front: the upper mandible transversely indented, and marked alternately with black and yellow; the lower with similar furrows, placed much more obliquely. In the other sex, according to Sonnerat, the head and neck are black. Inhabits the Moluccas. Specimen from the former Macao Museum, presented by R. Inglis, Esq.

In *B. comatus*, if not also in *B. panayensis*, a marked dissimilarity of the sexes is observable; and the same prevails in the three species next in order, which are nearly allied together. These have the throat naked and distensible; with the skin of a bright colour. The first alone has no trace of casque, beyond a slight bulging at the base of its upper mandible.

15. *B. nipalensis*, Hodgson: vide XII, 989. Size very large. The female wholly black, except the tips of the wings and tail, which are white: whereas the male has the head, neck, and under-parts, deep ferruginous, passing to maroune on the abdomen and thighs. Young coloured like the adults. Upper mandible with numerous broad transverse channels, each coloured black along its posterior half or more. This great species inhabits the S. E.

Himalaya, also the hill ranges of Assam, and of Munneepore. I have retained an adult male and female, from Munneepore, presented by Capt. Guthrie: and a young male, presented by B. H. Hodgson, Esq.

The two next, with certain other species, as *B. cassidix* of Celebes and the Moluccas, and *B. ruficollis* of New Guinea, are very closely allied together. They have a peculiar wreathed or plaited casque, flat or a little bulged in some, more inflated in others: and the females are wholly black with a white tail; the males having the head and neck either uniform rufous (as in *B. ruficollis*), or the occiput and nape, with median line of the crown, are deep maronne, the sides of the head and front of the neck being yellowish-white.

16. *B. pusaran*, Raffles: *B. ruficollis* apud nos, XII, 176: described in XII, 990. Size of *B. rhinoceros;* with the base of both mandibles transversely ridged in adults: in the full grown young, these lateral ridges of the beak do not appear till after three or four corrugations are exhibited on the casque, prior to which the bill much resembles that of *B. nipalensis* of corresponding age, except that the bulge in place of the casque is more decided.* Inhabits Sylhet, Arracan, the Tenasserim provinces, the Malayan peninsula, and Sumatra. We have two adult males, from Arracan; presented by Capt. Phayre: adult female, and young male, from Malacca, presented by E. Lindstedt, Esq.: and an adult male, with unusually flat casque (described in XII, 991); presented by J. Middleton, Esq.

17. *B. plicatus*, Latham, Shaw (nec Drapiez, which is *B. ruficapillus*, Vieillot): *B. obscurus*, Gmelin; *B. subruficollis*, nobis, XII, 177: described in XII, 990. Resembles the last, but is smaller, with never any lateral ridges to the mandibles: the gular skin is said to be blue, instead of yellow as in the other. I have only seen it from Arracan and the Tenasserim provinces, in which latter territory it would seem to be very common. We have a male from Arracan, presented by Capt. Phayre; a Tenasserim male, procured by the late Dr. Helfer; and a Tenasserim female, presented by the Rev. J. Barbe.

The last upon the list is the most remarkable of all the oriental Hornbills: having a short bill, but little curved, surmounted by a moderately high casque, tolerably broad, and abruptly truncate in front, where it presents a very considerable thickness of massive bone; the throat, neck, and interscapulary region are quite naked; and the middle tail-feathers are greatly elongated, being twice as long as the rest.

18. *B. galeatus*, Lin.: vide XII, 997. Size of *B. rhinoceros;* and colour brownish-black, with white belly, wing-tips, and shoulders of wings internally; tail of a buff or drab-white, each feather having a subterminal black band; the crested occiput black, with ferruginous on the sides of the head: beak

* For notices of the mode of growth and successive replacement of these wreaths and ridges, vide XII, 990, 992.

and casque coral-red, the front of the casque and terminal half of the mandibles yellowish. Young browner, with a tinge of rufous on the breast: the bill and incipient casque wholly pale yellow. Inhabits the Malayan peninsula and archipelago. Adult and young (now in very bad order); presented by J. Middleton, Esq. These specimens, with the very large *B. cavatus* presented by D. McCosh, a Rhinoceros Hornbill since replaced, and to a less extent our *B. hydrocorax*, were much injured by exposure to the dust and attacks of insects, prior to my taking charge of the museum. Our other specimens of this genus are, without exception, in excellent order.

Genus *Irrisor*, Lesson, vide XIV, 188.

*I. erythrorhynchos; Upupa erythrorhynchos*, Latham. From S. Africa. Specimen presented by Lord A. Hay.

Genus *Upupa*. Lin. (as restricted).

1. *U. epops*, Lin. European Hoopoe. Common in Northern India, Bengal, Arracan, &c.; and occurs rarely in the Nilgherries. Two specimens, from the neighbourhood: another pair (very rufescent), from the Tenasserim provinces; presented by the Rev. J. Barbe: vide XV, 11.*

2. *U. senegalensis* (?), Swainson: *U. minor* apud Jerdon: vide XIV, 189. Common in the peninsula of India. Two specimens, from Goomsoor; presented by Capt. Malcolmson.

3. *U. minor*, Shaw. From S. Africa. Specimen presented by Lord A. Hay.

Of the great genus *Buceros*, we accordingly now possess 44 mounted specimens, pertaining to 18 species. In the Catalogue published in the Journal for 1841, p. 652, only 3 specimens are enumerated, viz. *B. hydrocorax* and *B. panayensis*, from the dispersed Macao museum, and the *B. cavatus* presented by Dr. McCosh: but the following Malayan specimens, presented by J. Middleton, Esq. (late of the Hindu College), were also in the museum when I took charge of the Society's collections, in September of that year,—*B. rhinoceros*, *B. bicolor*, *B. pusaran*, and adult and young of *B. galeatus*. We had thus not a single Indian specimen of this genus, unless the Assamese example of *B. cavatus* be so regarded: and all the large specimens, except *B. pusaran* and *B. bicolor*, were considerably injured by exposure on top of the glass-cases in the (then) bird-room. At present we cannot boast a single African species, and are poor in those inhabiting the more distant countries of the Eastern Archipelago.

The species of Hornbill inhabiting the peninsula of India, are only four in number; and I doubt much whether any additional species occurs in Ceylon. Three of these—*B. pica*, *B. birostris*, and *B. gingalensis*,—are con-

* I have seen no Hoopoes from the Malayan peninsula; nor is this genus mentioned in the Sumatran and Javanese catalogues of Sir Stamford Raffles and Dr. Horsfield.

fined in their distribution to India proper, the second only extending its range to Bengal; while the third has not elsewhere been observed than in Malabar and Ceylon. The great *B. cavatus* is alone common to both sides of the Bay of Bengal; continuing its range southward to Sumatra (where noticed by Raffles), if not further. Along the sub-Himalayan region, in Nepal, Bengal, Assam, Sylhet, Arracan, and the Tenasserim provinces, *B. pica* is replaced by *B. albirostris*: and in the S. E. Himalaya, the range of the great *B. nipalensis* commences, and extends eastward at least to Munnecpore. There, most probably, and certainly in the vicinity of Cherra Poonjee, *B. pusaran* occurs, and ranges southward through all the intervening countries to the Malayan peninsula and Sumatra; and in Arracan and Tenasserim there is also the *B. plicatus*. The only species I have seen from the last named territories are *B. cavatus*, *B. albirostris*, *B. pusaran*, and *B. plicatus*. In the Malayan peninsula the species are particularly numerous: besides *B. cavatus* and *B. pusaran*, there are the remarkable *B. galeatus*, the otherwise remarkable *B. rhinoceros*, and *B. intermedius*, *B. bicolor*, *B. malayanus*, *B. cariuatus*, and *B. comatus*,—all in the Society's museum; and also, it would seem, the *B. corrugatus*, Tem. (*v. rugosus*, Begbie, described in *Ann. Mag. N. H.* 1846, p. 404.*) With the last named I am unacquainted; nor have I much information respecting the distribution of these birds in the islands.

The most anomalous species of this great genus known to me, are the long-legged *B. abyssinicus* (or *Abba Gumba* of Bruce), upon which M. Lesson founds his ill-constructed hybrid name *Bucorvus*, and the Malayan *B. galeatus*. The only further dismemberments noticed in the second edition of Mr. G. R. Gray's 'List of the Genera of Birds,' are *Toccus*, Lesson, founded on *B. erythrorhynchos*, Brisson, and *Euryceros*, Lesson, founded on a species named *Prevostii* by that naturalist. A good group is however formed by the species with well developed casque, the hindmost portion of which rises high above the coronal feathers; as typified by *B. cavatus*, *B. rhinoceros*, *B. hydrocorax*, and *B. pica*. Another good group consists of those with wreathed casque, naked throat, and dissimilar plumage in the sexes; as typified by *B. cassidix* and *B. ruficollis*: *B. nipalensis* ranging here as an aberrant species. And the rest, while according throughout in having the

* "This species is 2½ ft. long. Body, wings, and tail, black, with the exception of the cheeks, shoulders, and throat, which are dirty white, mixed with cinereous. One-third of the tail from the tip smoky-white; helmet and pouch-like protuberance under the throat crimson, the former furrowed with three deep indentations. Upper mandible yellowish-brown, inclining to white at the tip: the basal half of the lower mandible ochraceous and transversely caniculate; remainder of the mandible dirty white."—Begbie.

casque, when present, low and compressed, with its hindmost portion rising gradually from the forehead and more or less concealed by the feathers, differ so variously in other respects that no two before me can be specially approximated together. Still, an examination of the remaining species of the genus might elucidate their mutual affinities.

For the above reason, with the view of tracing those affinities, our desiderata comprise all species not included in the foregoing list. Of those of India, we have not the young of *B. cavatus*, nor of *B. pica ;* nor the young female of *B. nipalensis :* and more specimens of *B. gingalensis* would be acceptable. And of the species inhabiting the Malayan peninsula, we want *B. corrugatus ;* the young of *B. comatus* and of *B. bicolor ;* and good series of *B. intermedius* and *B. nigrirostris*, with males of *B. malayanus :* also, especially, good specimens of *B. galeatus ;* and any species procured in the Archipelago.

E. Blyth.

---

*Addendum* to Report on the *Sciuridæ*, p. 864 *et seq., ante.* In a letter just received from Mr. Jerdon, now stationed at Tellicherry, on the Malabar coast, that gentleman remarks—"With regard to the Squirrels, we have, of course, the large one *(purpureus)*, sometimes all red, sometimes with a considerable mixture of black; but never nearly all black, and never with tuftless ears. We have also *tristriatus* to the exclusion of *palmarum*, throughout the whole Malabar coast from Cape Comorin, only extending to the forests at the edge of the ghâts above. Throughout all the Carnatic, Mysore, Hydrabad, &c. only *palmarum*. I suspect the *tristriatus* is never found far from forest country. The *trilineatus* occurs, I find, in some of the forests of the ghâts as well as in the Nilgherries."

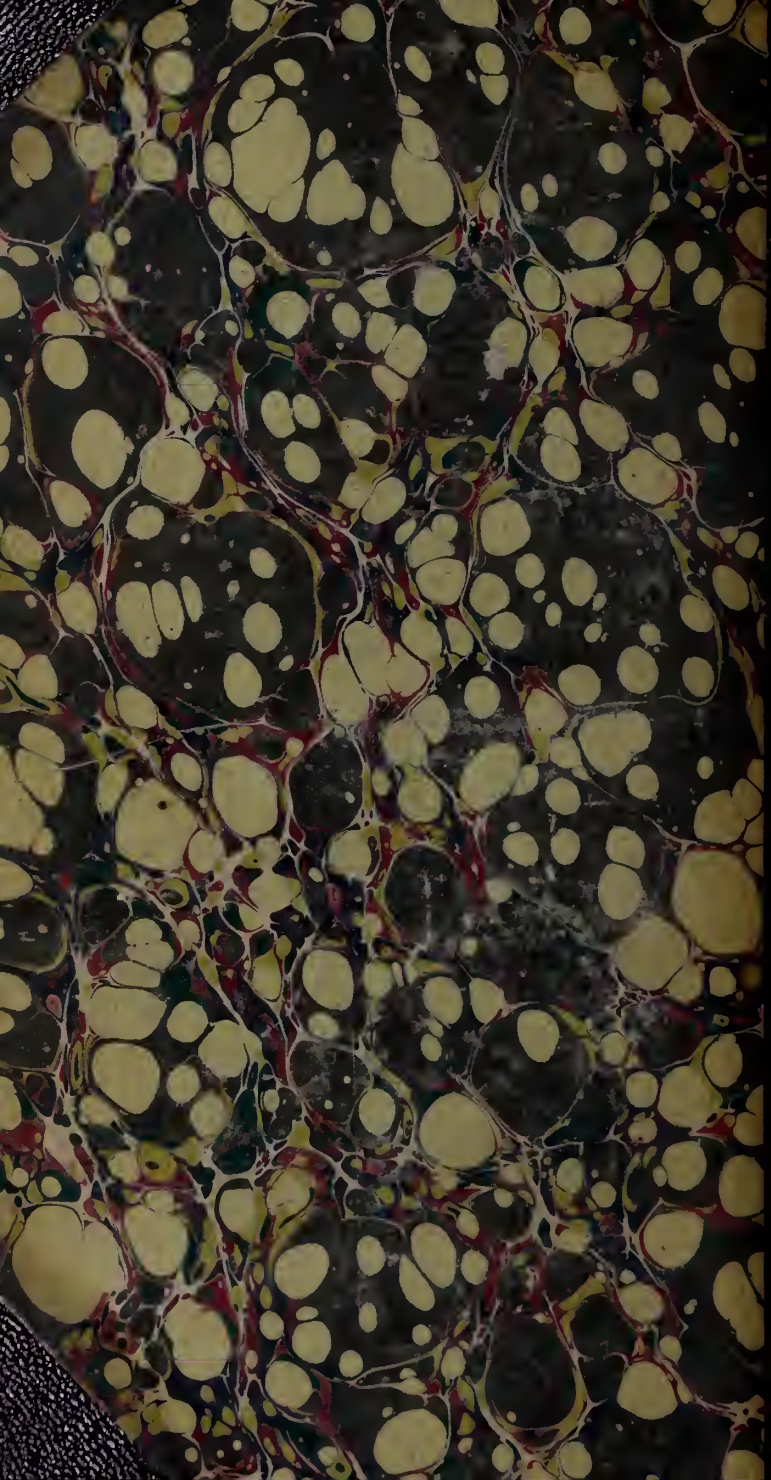
E. B.

# *Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of Augt.* 1847.

| Days of the Month. | Maximum Pressure observed at 9h 50m. | | | | | | Minimum Pressure observed at 4 p. m. | | | | | | Maximum Temperature. | Rain Gauges. Elevation. | | Moon's phases. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Barometer reduced to 32° Fahrenheit. | Temperature. Of the Mercury. | Of the Air. | Of Wet Bulb. | Wind. Direction from sunrise to 9h 50m. | Aspect of the Sky. | Barometer reduced to 32° Fahrenheit. | Temperature. Of the Mercury. | Of the Air. | Of Wet Bulb. | Wind. Direction from 9.50 a. m. to 4 p. m. | Aspect of the Sky. | | Feet 40 Upper Inch | Feet 4 Lower Inch | |
| 1S | In.29.528 | 90.0 | 89.5 | 83.0 | S. | Cumuli. | In.29.443 | 89.0 | 88.9 | 82.6 | S. | Cloudy. | 92.0 | .. | .. | |
| 2 | .500 | 90 0 | 89 8 | 83.8 | S. | Ditto. | .426 | 88.0 | 87.2 | 82.0 | S. | Ditto. | 93.5 | 0.08 | 0 14 | |
| 3 | .528 | 87.5 | 86.0 | 81.4 | N. | Cloudy. | .429 | 87.0 | 86.0 | 81.0 | W.S.W. | Ditto. | 92.3 | 0.13 | 0.22 | ☾ |
| 4 | .532 | 89.5 | 89.0 | 82.1 | E. | Cumulo strati. | .431 | 89.0 | 88.0 | 81.0 | E. | Cumulo. | 91.8 | .. | .. | |
| 5 | .555 | 85.8 | 86.5 | 82.0 | E. | Cloudy. | .455 | 86.0 | 85.0 | 82.0 | N. E. | Cloudy. | 93.0 | 0.36 | 0.43 | |
| 6 | .575 | 84.5 | 84.3 | 81.0 | S. | Ditto. | .491 | 89.0 | 88.0 | 80.2 | S. | Ditto. | 89.5 | 0.19 | 0.26 | |
| 7 | .608 | 90.0 | 88.0 | 83.3 | S. | Ditto. | .546 | 82.0 | 81.8 | 80.0 | S. E. | Ditto. | 90.0 | 0.66 | 0.74 | |
| 8S | .657 | 84.5 | 83.5 | 80 0 | E. | Ditto. | .583 | 83.6 | 80.0 | 78.0 | S. E. | Rain. | 87.0 | 1.76 | 1.83 | |
| 9 | .670 | 80.5 | 80.9 | 78.9 | E. | Ditto. | .573 | 86.7 | 85.2 | 81.9 | S. | Cloudy. | 87.5 | 1.10 | 1.17 | |
| 10 | .668 | 87.0 | 84.1 | 81.5 | E. | Rainy. | .635 | 81.0 | 81.0 | 78.4 | S. | Ditto. | 87.0 | 0.66 | 0.75 | |
| 11 | .707 | 83.0 | 83.0 | 79.5 | N. E. | Cloudy. | .582 | 85.4 | 85.0 | 81.0 | S. W. | Ditto. | 85.8 | 0.83 | 0.93 | ● |
| 12 | .641 | 87.0 | 85.0 | 80.0 | W. | Cumulo strati. | .499 | 87.0 | 85.0 | 81.8 | N. | Ditto. | 91.7 | .. | .. | |
| 13 | .573 | 88.8 | 88.4 | 83.0 | N. E. | Ditto. | .435 | 92.0 | 91.0 | 81.8 | E. | Cumulo strati. | 93.4 | .. | .. | |
| 14 | .505 | 89.5 | 88.0 | 82.7 | E. | Cumuli. | .414 | 91.0 | 85.4 | 81.2 | S. | Rain. | 95.0 | 0.16 | 0.25 | |
| 15S | .546 | 88.0 | 87.0 | 80.4 | E. | Cloudy. | .446 | 88.1 | 87.2 | 81.2 | E. | Cumulo strati. | 90.0 | 1.26 | 1.30 | |
| 16 | .559 | 79.8 | 80.0 | 78.8 | E. | Rain, thundering. | .484 | 84.0 | 83.8 | 80.9 | S. E. | Cloudy. | 84.0 | 1.24 | 1.33 | |
| 17 | .570 | 86.0 | 85.9 | 82.3 | S. | Cloudy. | .477 | 81.8 | 82 5 | 80.7 | S. | Nimbi. | 89.5 | 2.60 | 2.74 | |
| 18 | .581 | 82.6 | 82.8 | 80.5 | S. | Drizzly. | .530 | 80.0 | 80.9 | 79.0 | S. | Drizzly. | 82.9 | 1.70 | 1.87 | |
| 19 | .642 | 81.8 | 81.1 | 79.2 | S. | Nimbi. | .572 | 83.0 | 83.0 | 78.5 | S. | Cloudy. | 86.0 | 0.12 | 0.20 | ☽ |
| 20 | .732 | 82.0 | 81.5 | 78.8 | S. | Ditto. | .639 | 87.2 | 86.1 | 82.2 | S. | Cumulo strati. | 87.9 | .. | .. | |
| 21 | .755 | 89.3 | 88.0 | 83.0 | S. W. | Cumuli. | .638 | 91.4 | 90 5 | 81.5 | S. | Ditto. | 93.0 | .. | .. | |
| 22S | .709 | 89.5 | 88.7 | 83.0 | W. | Ditto. | .597 | 85.0 | 83.8 | 79.8 | S. | Nimbi. | 93.6 | 0.04 | 0.10 | |
| 23 | .638 | 90.5 | 89.8 | 83.0 | N. W. | Ditto. | .530 | 90.0 | 88.0 | 83.0 | S. E. | Cloudy. | 93.0 | 0.44 | 0.50 | |
| 24 | .629 | 83.9 | 83.5 | 79.8 | N. E. | Drizzly. | .528 | 85.0 | 84.8 | 80.0 | S. | Ditto. | 87.8 | .. | .. | |
| 25 | .710 | 89.8 | 87.0 | 81.8 | S. E. | Cirro strati. | .592 | 88.5 | 87.0 | 79.5 | S. | Ditto. | 91.3 | 0.07 | 0.12 | |
| 26 | .680 | 90.0 | 88.2 | 83.0 | S. | Cumulo strati. | .552 | 91.5 | 90.2 | 82.0 | S. | Cumulo strati. | 92.5 | .. | .. | ○ |
| 27 | .680 | 90.0 | 88.0 | 82.5 | E. | Ditto. | .584 | 87.5 | 86.8 | 81.6 | S. E. | Cloudy. | 93.6 | .. | .. | |
| 28 | .748 | 90.4 | 89.0 | 83.0 | E. | Ditto. | .608 | 88.7 | 84.0 | 80.1 | S. E. | Rain. | 92.5 | 0.14 | 0.21 | |
| 29S | .707 | 90.5 | 89.0 | 80.0 | E. | Ditto. | .587 | 89.0 | 87.0 | 81.0 | S. E. | Cloudy. | 93.3 | .. | .. | |
| 30 | .692 | 91.0 | 89.0 | 82.0 | E. | Ditto. | .585 | 93.2 | 91.1 | 80.0 | S. E. | Cumulo strati. | 95.3 | .. | .. | |
| 31 | .703 | 90.6 | 88.4 | 81.8 | N. E. | Cumuli. | .623 | 88.5 | 87.0 | 81.8 | S. E. | Cloudy. | 93.3 | .. | .. | |
| | | | | | | | 29.533 | 87.0 | 85.4 | 80.8 | | | 90.6 | 13.54 | 15.09 | |

Pl XXXII.

FIG. 1.

MAP OF PART OF THE PROVINCE OF KUMAON North of Almorah. Showing *the Sources of the Pindur River.*

For use in Library only